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AMERICAN VETERINARY REVIEW,

APRIL, 1880.

ORIGINAL ARTICLES.

CASES OF EMBOLISM OF THE POSTERIOR AORTA, ITS COLLATERAL AND TERMINAL BRANCHES.

BY A. LIAUTARD, M.D., V.S.

Read before the New York Pathological Society.

An investigation of the literature of the diseases of arteries and specially of embolism, will give very little satisfaction, if made through English veterinary works. English periodicals, specially the *Veterinary Journal*, present their readers only with a few observations, and most of those are taken from continental papers. Williams, in his excellent work on Practice, gives to the subject, in the article on arteritis and embolism, only a short notice. French and German authors have, on the contrary, given a good deal of attention to this important lesion, and thanks to the long series of observations made and reported by Prof. A. Goubaux, of Alfort, and Prof. Bollinger, of Munich, veterinarians have become quite familiar with these diseases.

That all arteries may become the seat of disease and may be found plugged up by clots, no one will deny, and that according to the location of the diseased process a different series of symptoms will be observed. Bollinger has shown us how it may often be the cause of fatal attacks of colic. Bouley and Goubaux have taught us how it may be accompanied by entire paraplegia or by peculiar forms of lameness of one or both of the hind extremities.

It is with the desire of increasing the number of recorded observations in our English literature that we present our readers the two following cases :

Thanks to the kindness of Mr. Lockhart, M.R.C.V.S., and Prof. Robertson, M.D., V.S., of New York, we had the opportunity to observe them and to make post-mortem examinations, and in both the symptomatology and lesions, we hope, will be found as they were to us, most interesting and instructive. In the first one we made no positive diagnosis, as the animal died before we could proceed to our examination. In the second, on the contrary, we had the satisfaction not only to confirm it, but also that of the students of the American Veterinary College, before whom we had the pleasure of developing the symptoms almost to our will. But what will prove most interesting to the old practitioners, and what will probably be difficult to understand, is the excessive and sudden development of the symptoms, their rapid and fatal termination, while at the same time, by the condition of the lesions, there will not remain the slightest doubt, for one horse at least, that the diseased process must have existed for several months before anything amiss could be detected.

The first case is that of a handsome bay horse, about seven years old, who, up to some months ago, had never been sick. At that time he became lame forward, and after treatment was sent out to the country. Being needed for work, he was brought back to the city. On arriving at the owner's stable he was found in perfect condition and perfectly able to resume his work, with the exception of a little swelling on his sheath which was cedematous, slightly warm and not painful. He then received a dose of cathartic, and with some hygienic care in cleansing and diet he was

soon able to resume his work, which he performed to all satisfaction for fourteen days. After that length of time the swelling of the sheath is found one morning to have returned. Diuretics are given, and he is put again in harness two or three days after, in apparent good health. After working for two days he is ridden by the coachman on a Saturday to Mr. Lockhart's office. This gentleman finds him very stiff behind, and apparently in great suffering, for his body is covered with profuse perspiration; his countenance is that of great pain, and he is walked back to his stable, a distance of a little over a mile. Visited in the evening, he is comfortably in his stall, eating, and presenting nothing abnormal.

The following day, Sunday, Mr. L. is called in a hurry to the stable; he finds the animal in great pain, with the left hind leg enormously swollen, sweating abundantly and suffering with diarrhoea without having shown any abdominal pains. The next morning the leg has resumed almost its normal size; all pains have subsided, the animal eats well, lies down and gets up without difficulty, though he remains but a short time in the recumbent position; during the night he has passed by rectum a great quantity of blood (two or three quarts, says the coachman, who is an intelligent hostler.)

Dr. Robertson was then called in consultation. A doubtful diagnosis was made of some lesions of the internal blood-vessels, probably of the iliac arteries, and a fatal prognosis was given to this peculiar series of symptoms.

From this day to the end of the week the horse remains pretty well in the same condition, at times worse than at others; still he remains restless, lies down and gets up oftener, and remains lying down for a shorter time than before; he now begins to require a little assistance to rise from his bed.

Having decided to have him destroyed, on my urgent request, to exhibit him to the class, and make a diagnosis, which we had expressed the opinion, was probably that of embolism of the posterior aorta or its branches, and to have the opportunity to make a more minute post mortem, the horse was brought to the hospital of the College on Saturday evening and placed in slings to

prevent him from injury, in case he should not be able to get up, examination being postponed to the following day. He was found the next morning lying down, with the slings broken and in fact in a dying condition. Death takes place about 12 o'clock, and the post mortem was proceeded with immediately, having thus lost the opportunity of an examination rendered impossible and dangerous by the dying struggles of the patient.

The subcutaneous tissue of the left leg is considerably congested, the lymphatic vessels and glands swollen, and the superficial veins dilated and gorged with thick and syrupous blood. The abdomen being emptied to render the examination of the main arteries easier, an aneurism of the great mesenteric is exposed. It is a large round mass, of the size of a good sized apple and entirely filled with an organized clot, composed of different layers which seem to close up the cavity completely. This clot extends backwards into the posterior aorta, and thus obliteration is found in the left circumflex iliac, the external and the internal iliac of both sides, with however, some differences in the extension of the diseased process. It is thus that on the left side, the external iliac is plugged way down, the clot being traced not only in the collateral branches but down to its termination into the tibial arteries and even below these as far as the hock. The internal iliac on the same side is also obliterated, back into its termination the obturator and iliaco-femoral; beyond those points the arteries seemed empty. On the right side, the internal iliac is also obliterated, but the clot scarcely reaches the terminal branches. The right external iliac is empty, but its coats are thicker and seem stronger than usual.

The clot of the mesenteric artery is firm, hard, and composed of a whitish mass, well organized and more or less adherent to each other. The walls of the artery are thin; some of the ramifications of this trunk going to the small intestines, show also clots at different stages, here white, organized and hard; there black or of red color and of more recent formation.

The embolism of the aorta back to its termination varies also in aspect. Forward to as far as the circumflex it is white, hard and composed of circular zones of old clotting of the blood, while

posterior to this the embolism is of a redder color, indicative of a more recent formation.

The external iliac, near its origin, contains a large clot of thick syrupous fluid, which is continued down into the femoral by an older deposit, and this is prolonged down into all the branches arising from that trunk by fibrinous deposits of a darker color and somewhat softer organization. The smallest arteries are plugged up with red clot.

The muscular structure of the left leg is engorged, and the deep muscles have lost their dark red coloration; they have become pale, softer, and are maculated here and there by what seems to be an interstitial hemorrhage.

The remainder of the body, as far as the post mortem examination was carried, seemed to be perfectly healthy.

The history of the second case is not less interesting or surprising, so far as the rapidity with which the symptoms exhibited themselves.

This horse, as far as known, had never been sick or lame. One day, while in harness and returning from a drive, he suddenly became lame, and was with much difficulty returned to his stable. The next morning he was found perfectly well. A few days later he was returned to his work and behaved in the same manner, and then kept on this way for about three weeks. Dr. Robertson saw him, and though he suspected lesions of some large arterial trunks of the right hind leg, he had no opportunity to make his diagnosis positive.

At his suggestion the horse was brought to the College. As he arrived there, one morning, he presented the following conditions: His skin is profusely covered with cold perspiration; his countenance is very haggard; his nostrils dilated; his eyes staring; his pulse is very fast, weak and irregular. The function of locomotion is very difficult, walking very painful, the lameness, being excessive, is located in the right hind leg. While at rest this is carried in abduction, and the seat of violent motions, spasmodic pains which the animal manifests by suddenly raising his leg from the ground, carrying it violently in abduction and

keeping flexed and elevated from the ground. This leg is much cooler than the other.

The animal is placed in a stall; a few minutes later the pains seem to subside, and an hour afterwards he is free from lameness, rests comfortably, and looks for food.

At about one o'clock I made a rectal examination and found the pulsations entirely absent in the right internal iliac and much weaker in the external artery of the same side; those of the left felt healthy. Diagnosis is then made accordingly.

That same day at two o'clock (he has been in the college about four hours) he is brought before the class of students.

Now that he is cool he seems to be in perfect health. A man jumps on his back and he is put to trotting exercise in the street. After a few minutes the irregularity of action begins to be detected; first it is a stiffness of the right leg, then it becomes more marked; the abduction of the leg is well evident. Soon the animal becomes quite lame; and the moment he is returned to the hospital, the same symptoms as those presented in the morning, are well observed by the students. Rectal examination demonstrates to them also the condition of the arteries, and all those who have examined him can make a similar diagnosis.

We advise the animal to be destroyed. The owner hesitates, doubts probably the correctness of our verdict; told that we are in error, that all the trouble with the animal is a *sprain*, or *cold in the loins*, he allows the horse to be placed under the care of a *Veterinary Surgeon* (?) who applies a severe blister upon that region. After a few days, sufficient for the application to produce all its effects, the horse is returned to his owner, said to be *convalescent*. So as to give some exercise, a boy on one afternoon is put on his back; he takes him round the block two or three times; but suddenly the horse is taken very ill; he is brought back to his stable, and, we understand, dies at eleven o'clock that evening, in the greatest agony, having shown abdominal pains, so the owner reports.

The post mortem was roughly made in the afternoon of the following day at the rendering dock, when the animal was already in a state of putrefaction.

The abdominal organs being removed, the abdominal aorta is found empty as far as the point of its quadrifurcation. At this point the internal face of the artery, which is thin, is found firmly adherent to a white plastic exudation, itself continued to a clot which, as we follow it in the iliac, increases in size.

The internal iliac of the right side is completely filled. The external is partly so. The clot extends in the ramifications of these arteries, and seem, as in the first case, presenting characters of different ages of formation. At places it is hard, white, and well organized, at others of a redder color and softer. This condition is followed down the tibial region, the posterior tibial being also obliterated.

The arteries of the left side are also diseased, but not to the same extent, the cavity of the arteries being only partly filled by the clot of blood.

In looking over the record of the observations collected by Goubaux, published in 1840, and over those published since, we have found the lesions described corresponding more or less with those of this last case, but we believe that those of the first case have never been observed or recorded.

If, now, we look at the length of time elapsing between the moment when the animals showed any signs of disease, (scarcely three weeks in the first case, if we count it from the day he returned from the country to the time of death, and about five weeks in the second;) and if we take into consideration the enormous lesions presented by those animals at the post mortem, indicative of a long standing of diseased process, much matter for thought will be offered to the pathologist and the practitioner. It will certainly remain a difficult matter to explain how (and this especially in the first case) an animal has been able to conserve all the appearances of health, to have remained free from all the ailments known to be the consequence of such lesions as those found at the great mesenteric artery, (repeated attacks of colic) or in the posterior aorta (paraplegia), and yet be affected with the disease of the circulatory system, which certainly must have been in existence for months before it became manifest and such as to need medical interference.

CHLORAL HYDRATE AS AN ANÆSTHETIC FOR OPERATIONS.

BY C. H. PEABODY, D.V.S.

Read before the United States Veterinary Medical Association.

Mr. President and Gentlemen : The few remarks I offer to you on this subject are hastily taken from the notes of my cases book, showing the success I have had in the use of chloral hydrate as an anæsthetic. Never having seen any report made of its having been used as such, I take this opportunity to report a few cases in which it has given me satisfactory results.

CASE No. 1.

April 16th, 1879.—A cow with retention of placenta, had been straining all day and night of the 15th. I removed it; and on the night of the 16th I was called again, and found inversion of the womb with constant straining: gave $\bar{3}$ iss of chloral hydrate in solution, washed the womb and vagina with the same, of about one part to forty of water; in about half an hour, straining stopped. I replaced the womb without much difficulty, then strapped the animal with a truss. She was quite easy, and laid down and was quiet all night, and gave me no further trouble.

CASE No. 2.

July 5th, 1879.—A cow, which had got loose from its hitching rope, with a part of the rope attached to the halter, was lost in the woods and missed for four days; when found, the rope was twisted around the fetlock of the off hind leg, so one could see and feel the flexor tendons of the digits; the leg was swollen, and very painful, the animal not allowing it to be touched.

Having no hobbles, and being in the country, and with no one to help me, but an aged couple, I gave the animal chloral

hydrate $\frac{3}{4}$ ii in solution, and tied her to a tree; in about one-half hour I tried to handle her foot, and, much to my surprise, she allowed me to handle it, even to taking my scissors and trimming off the ragged and sloughing portions of the skin and tissues, the animal scarcely moving throughout the whole operation.

July 6th.—Saw the animal, and gave an $\frac{3}{4}$ i of the solution, and re-dressed it, without much trouble, the animal scarcely moving.

CASE No. 3.

August 27th, 1879.—Was called about 8 p. m. to go about 13 miles into the country to see a large roan stallion suffering with colic. I arrived there about 10:30 p. m., and obtained the following history:

This horse is 11 years old; he has had these colic spells at times for four or five years, and has always recovered from them until to-day. He has them worse when worked hard, and in hot weather he will roll on his back, and lays down with his legs up for an hour at a time. On examination, I found the animal suffering from scrotal hernia. I gave $\frac{3}{4}$ iss chloral hydrate in a ball; in about three-quarters of an hour I operated without any hope of success; during the operation the horse hardly moved or struggled. I finished the operation, removed the ropes, and let the animal lie. He did not get up until 8:30 the next morning, and, much to my surprise, recovered.

CASE No. 4.

September 12th, 1879.—A bay horse, whose owner said was 19 or 20 years old, had a punctured wound of the off hind foot of about three weeks standing, and it was impossible to approach him to touch the foot. On September 13th, at 3 p. m., $\frac{3}{4}$ vi chloral hydrate was given him in a ball; when all things were ready, which was in about thirty minutes, I placed the hobbles on him, and threw him. I removed a good portion of the sole and part of wall of the foot; I found a necrosed condition of the inferior face of the os pedis, which I scraped. During the operation the animal hardly struggled, not even when I cut through

the velvety tissue, or in the seraping of the bone; the animal lay still until about 8 A. M. the following morning, and the stableman said he had a fine rest. He made a good recovery.

CASE No. 5.

December 9th, 1879.—A bay mare on which I was to perform the operation of ovariectomy. At 2:30 P.M., gave chloral hydrate 3 vi in a ball; at 3 P. M. I operated, and did not have any straining at all, the animal keeping perfectly still, and showing no resistance on the introduction of the hand, during any part of the operation, and evinced no pain, the pulse only increasing to fifty the following day, and the temperature rising to one hundred and two.

December 11th.—The pulse was sixty, temperature, 103; apparently in no pain. I gave tincture of opium in $\frac{1}{2}$ oz. doses every four hours. The next day I myself was taken sick, and have not seen or heard from this animal since.

This, gentlemen, is my success in some few cases where I have used chloral hydrate as an anæsthetic in operations. Hoping they may be of some interest, and, as we have nothing else we can use so readily, that they may bring forth remarks or criticisms on the subject from the members present, I will be glad if by presenting them to you I have succeeded in inducing some of you to try it and to give publication of the results obtained.

CONTRACTION OF ORIFICIUM UTERI EXTERNUM.

BY G. ZEUNER, V.S.

About a year ago I was called to attend a cow, which, as the owner called it, "could not calf." On my arrival I found a fine young black cow which was to have her first calf; by introducing my hand in the vulva I could feel the front feet of the fœtus still in uterus; by pushing the fœtus back I discovered the mouth of

the uterus perfectly closed. On inquiry the owner said she was in that condition about 24 hours. The cow was restless, continually twitching with her tail, and sometimes had strong labors to discharge the young, but all in vain. I applied extr. belladonna with my hand at the closed mouth of the womb, and after about one hour I had the pleasure of delivering the cow of a healthy heifer calf. The placenta soon followed and both cow and calf are doing well.

About one month ago I was called to the same cow. The owner said he tried his best to help the cow, but could do nothing (by the way the man has a repute of being "a smart man amongst cows.") This time he had waited longer before he sent for me (48 hours) and I found the patient in a worse condition than at the former time. The part of the womb mentioned above had this time turned to cartilage and had a low temperature. I used the bellad. again, and as the cow pressed but seldom and not very violent upon the foetus I ordered her to be kept quiet. This was in the morning. I went away to return in the afternoon. At my afternoon visit I was told the cow had been very sick after I had left. I found the part I had applied the belladonna to, to be of a very high temperature and could only get my index finger in the uterus; symptoms in general very bad. I made a decoction of pulv. sem. lini. with bellad. to be used during the night as injection per vulva. I left and promised to return in the morning.

7 o'clock A. M. cow was standing and eating. This time I found by introducing my hand that I was able to get it in the uterus; the cow began to press severely on the foetus, and in about 30 minutes the calf (bull) was born; both doing well. After the cow was dry I advised to have her fattened and slaughtered. I warn everyone, especially the young practitioner, not to be too quick with the knife. I have paid dearly for it, and I think the bellad. has almost done wonders in the above cases; still the above treatment is nothing new.

NOTES ON VARIOLA EQUINA.*

BY FRED. TORRANCE, B.A. VETERINARY STUDENT.

On the 4th of February a horse was admitted to the College Hospital for treatment. The owner said that a few days before he had noticed a slight eruption on the horse's heels, but thinking it a case of scratches he paid little attention to it. However, as the eruption showed no signs of healing, and the leg began to swell, he brought him to the college for treatment.

On examination the following symptoms were noted: Pulse 33; respiration, 9; mucous membranes, normal; bowels, slightly constipated; appetite good; skin, tender and irritable, the animal shrinking from the touch; coat staring.

The left hind leg was swollen and painful, and the animal was very unwilling to move. On closer examination of this leg, a large sore was found in the hollow of the pastern. It was yellow in color in the centre and surrounded by a red edge, and was covered with a peculiar yellowish gummy fluid, having a characteristic *mousy* smell, and feeling between the fingers like the white of an egg. This sore was a little smaller than the palm of the hand. Surrounding it were a number of single vesicles, whose color and appearance were difficult to distinguish owing to the pigment in the skin and the long hair of the part, but the same gummy fluid exuded from each and stuck to the surrounding hair. On running the hand up the leg, numerous little nodules could be felt, like peas or buckshot in the skin. They were most numerous inside the leg, and extended up almost to the belly. About six inches below the hock on the inside, another sore was found, similar in appearance to the former but smaller in size and covered with the same glarisy fluid, which trickled down the leg, gumming the hairs together.

The right leg was not swollen but had a similar sore in the

* Read before the Montreal Veterinary Medical Association, Feb. 19, 1880.

hollow of the pastern. A few discrete vesicles surrounded it but no nodules were felt on the leg.

On the front legs no eruption could be seen except in the hollow of the pastern, where two or three of the nodules were felt. The rest of the body was free from vesicles, but the skin was tender to the touch and the hair not so smooth as in health.

From these symptoms variola equina was diagnosed and the following treatment prescribed: A purgative ball to relieve the bowels, and an ointment composed of carbolic oil and tr. benzoin equal parts, to be applied every morning to the sores.

This treatment was followed until the 9th, when the scab began to form on the heels. Pulse, 34; respiration, 9. Two ounces of fever mixture in one pint of water were administered, the dressing continued as before.

The fever mixture were repeated the next day and then discontinued, as there was no symptoms of fever or constitutional derangement. During the next four days the dressing was continued and the desiccation of the exudation and formation of scabs gradually extended until the 13th, when the horse was so much better that the owner removed him from the hospital. I have not seen the case since, but learn that he is now well enough to take a little exercise daily and will soon return to work.

* * * * *

This case has been selected, not for any particular interest it may have, but because it is an ordinary case of variola equina, and may be taken as a fair type of the disease in the present outbreak in Montreal. The eruption is generally confined to the hollow of the pasterns of the hind legs, and vesicles are not usually seen on other parts of the body; but in some cases, however, the eruption is general, and nodules can be felt all over the body, being particularly noticeable on parts thinly covered with hair—the lips, perineum and sheath. The vesicles in these cases may also be seen on the buccal membrane of the mouth; and inside the lower lip, where the skin contains no pigment, is the best place for studying the peculiar characteristics of the eruption.

I have not seen any of the pustules on the Schneiderian membrane, although Fleming says that they are frequently present

and may be mistaken for glanders. Such a mistake may occur in the pustular stage of the eruption, especially if the vesicles are confluent and the sub-maxillary lymphatics swollen from absorption of the exudation, and the crust not yet formed. But if the observer is not frightened at the thought of glanders and makes a close examination, he will see that the eruption of variola is merely superficial, involving only the epithelial layer, while in glanders the sub-mucous layer is affected, and even the cartilage may be involved. But if any doubt exists as to the identity of the disease, the examination may be postponed for a few days, when the symptoms of variola will be more fully developed.

The Continental Veterinarians lay considerable stress upon the similarity of these two diseases, but in this country, where, fortunately, glanders is uncommon, variola is more likely to be mistaken for a skin disease affecting the heels, and called scratches or cracked heels. This is a skin disease brought on by the alternate wetting and drying which horses' legs undergo in this climate, assisted by any predisposing cause that may be present. It may be compared to the chapped hands that we sometimes get from the same cause, viz: having the skin wet in cold weather. It is very easily distinguished from variola, and only an ignorant person would be likely to mistake the two. My excuse for mentioning it at all is that you will be called upon to remedy the mischief done by those persons in treating variola with poultices and stimulating or astringent lotions. Such treatment not only lengthens instead of shortening the course of the disease, but may produce permanent injury to the horse from the thickening and tumefaction of the skin of the part. The eruption of variola, like that of all exanthematous diseases, must run its natural course, and we can do nothing towards shortening it, and by our stupid efforts only bring on fresh complications. An example of this is seen in a case that was brought to the yard a few days ago. The horse had been suffering from an ordinary attack of variola, and the owner, being ignorant of the nature of the disease, procured from a druggist, as ignorant as himself, a bottle of liniment, which he diligently rubbed into the horse's heels. But with what result? The liniment only made the eruption

much worse and produced, besides, some ugly sores which involved, not only the skin, but the tissues beneath, almost into the joint. The leg was swollen and tumefied, and inside it two abscesses were forming on the course of the lymphatics.

Ponticing, another common remedy for scratches, has a very injurious effect on variola, producing tumefaction of the skin, and causing the pustules to develop into unhealthy granulations that may require treatment with caustics or the actual canterbury.

There is one other disease with which variola is apt to be confounded. It is a form of eczema affecting the heels of the hind legs. It is a non-contagious skin disease, characterized by an eruption of vesicles, which frequently resemble those of variola. They are generally pointed instead of depressed at the centre, and discharge a thin fluid which forms little flaky scales on the skin. Sometimes these vesicles become pustular and the discharge forms a yellow scab extremely like variola, and it is not surprising that variola should have been frequently mistaken for it. Another cause of error is the name "grease," which is indiscriminately applied both to this skin disease and to variola. Even Williams falls into the common error and describes both diseases under the name eczema impetiginodes or eczema pustulosum. The distinction between them is not very difficult, and if the observer remembers the shot-like feel of the nodules in the first stage of variola, and the peculiar smell of the exudation in the second, together with the constitutional symptoms, he will not be likely to mistake it for eczema.

The name *grease* possesses a peculiar interest from its connection with the discovery of vaccination. In his famous work on the cow-pox, published in 1801, Jenner says: "There is a disease to which the horse, from his state of domestication, is frequently subject. The farriers have termed it the *grease*. It is an inflammation and swelling of the heels, accompanied at its commencement with small cracks or fissures, from which issues a limpid fluid, possessing properties of a very peculiar kind. This fluid seems to be capable of generating a disease in the human body (after it has undergone the modification I shall presently speak of), which bears so strong a resemblance to the

“small-pox that I think it highly probable that it may be the source of that disease.”

These last words point to the horse-pox as the probable origin of human variola, but if Jenner thought it the cause of what he calls the “severest scourge of the human race,” he also ascribes to it the origin of vaccination; for in the next paragraph he continues: “In this dairy country a great number of cows are kept, and the office of milking is performed indiscriminately by men and maid servants. One of the former having been appointed to apply dressings to the heels of a horse affected with the malady I have mentioned, and not paying due attention to cleanliness, incautiously bears his part in milking the cows, with some particles of the infectious matter adhering to his fingers. When this is the case it frequently happens that a disease is communicated to the cows, and from the cows to the dairy-maids, which spreads through the farm until most of the cattle and domestics feel its unpleasant consequences. This disease has obtained the name of the cow-pox.”

These extracts are interesting as showing the views held by Jenner, of the relation of horse-pox and cow-pox to small-pox, views which have been considerably modified by the more searching investigations of recent years.

That cow-pox can originate from the inoculation of variolous matter from the horse is well known, but that it is always caused in this way is extremely doubtful, and it is more probable that this is an irregular mode of origin. The question of the origin of cow-pox, however, is not of as much practical importance as the relation of both horse-pox and cow-pox to small-pox, from its connection with vaccination. The deterioration of lymph stocks, and the difficulty of finding cases of genuine cow-pox from which to renew them, have led to the inoculation of cows with small-pox virus in the hope of obtaining from them fresh supplies of vaccine lymph. Success has been attained in many instances, particularly Ceely and Babcock in England, and Drs. Gassner and Thiele on the Continent; but other experimenters, after many attempts, have failed completely. Even those who have been successful speak of the difficulty of producing the disease in the

cow, and some have tried as many as forty times without success. In cases where lymph was obtained, it was used in the same way as ordinary vaccine lymph, and Ceely states that more than 2,000 subjects had been vaccinated with his variola vaccine lymph. But recent investigators have not been so fortunate, and in the experiments of the Commission appointed by the Society of the Medical Sciences at Lyons, although cows were successfully inoculated with small-pox, yet the lymph obtained from them produced in every case small-pox, sometimes of a violent type, and in one instance at least was fatal. Trousseau, in his lectures on clinical medicine, sums up the results of this Commission in the following words: "The learned reporter (*Chauveau*) has first shown that small-pox can be perfectly well communicated to the bovine species by inoculation, to which species it stands in the same relation as vaccinia to man; that is to say, that when an ox is inoculated with small-pox, it is thereby made proof against cow-pox, just as vaccinated man is proof against small-pox. But a much more practical point is that small-pox in its passage through the system of a cow is not transformed into vaccinia; it remains small-pox, and returns to its original state of small-pox when re-introduced into the human species."

With such evidence as this adduced by Chauveau, the question might have been considered settled, but a recent conference on animal vaccination held in London, has re-opened the question, and Mr. Fleming, in an able article to the *Lancet* of January 31, on "Human and Animal Variolæ," supports the view expressed by Chauveau that the domestic animals have each their peculiar variolæ, that within certain limits these may be propagated from one species to another by inoculation, but that this is an abnormal and artificial mode of causing the disease.

The limits of this paper do not allow me to enlarge upon this interesting branch of the subject, but if any of you desire to investigate it further, I would refer you to Mr. Fleming's article in the *Lancet* of January 31 and February 14, and also to a very exhaustive paper by Dr. Cory, on the "Relation of Cow-pox and Horse-pox to Small-pox," in St. Thomas' Hospital Reports, Vol. IX., 1879.

With regard to the contagious nature of *variola equina* there can be no two opinions. The rapid spread of the disease in the city, the frequent cases where it can be traced directly to inoculation, and especially the number of grooms and others who have taken the disease, prove this conclusively. Several cases of inoculation have occurred among the grooms in the city, and one of our own number is at present suffering from the malady ; but of these I will mention only one, which is interesting from the fact of its occurrence in a man who had previously had small-pox. This man, while grooming or dressing his horse, became inoculated through a slight abrasion of the skin on the back of his left hand. In a few days the usual symptoms of vaccination were seen in his hand, and a vesicle formed at the point of inoculation. By the eighth day this vesicle had become mature and showed the characteristic depressed centre in a red areola, exactly resembling the pustule of vaccination. The arm at the same time was swollen and painful, the swelling extending into the axilla. The scab subsequently formed, and the swelling gradually disappeared. It is curious that this man, whose face bore the unmistakable scars of small-pox, should have been susceptible to equine variola, and, like cases of persons taking vaccinia after small-pox, or even of taking small-pox the second time, must be referred to the idiosyncrasy of the individual until we find some other cause.

How the present outbreak in Montreal originated is a question of some interest, and unless we suppose it due to the introduction of an infected animal, we must admit its spontaneous origin. If arising from infection, where did the infected animal come from ? We know that since its previous visit in 1877 the disease has been occasionally met with in different parts of Canada, but never in the form of an enzootic, and in the neighborhood of Montreal it had disappeared for upwards of a year. This theory is therefore improbable unless we suppose the infected animal to have come from a distance. Atmospheric causes seem to have something to do with it: The present winter has been characterized by extreme mildness with frequent alternations of cold and wet, and this, taken in connection with the fact of the previous

out-break in 1877 occurring at the same season of the year, (February), must be regarded as a suggestive circumstance, if not as a predisposing cause.

EDITORIAL.

OUR FOURTH VOLUME.

Our friends and readers will receive this number, no doubt, with the same satisfaction that we have in issuing it. The first number of the fourth volume, it presents itself with the same prospect as its predecessors, and with firm will to surpass them in interest and usefulness.

Since its birth, the AMERICAN VETERINARY REVIEW has met with a success unequalled by any periodicals of its kind, specially if we consider the conditions under which it was issued.

Acknowledged by all at home and abroad as the representative of veterinary interests in America, it will be continued as such, if work and proper efforts are sufficient to reach this object.

Though no change will take place in the editorial staff, arrangements have been made, and we hope will be carried out, by which much matter of interest will be obtained for our paper, and thus we will, still better than in the past, be able to provide our readers with the most recent news and investigations, which may be presented to the profession either at home or on the continent.

Our correspondents will here accept our sincere thanks for their past kindness, and our readers for their friendly support during the last three years.

The veterinary profession in America has for the last few years made great strides on the road to improvement, and we can be proud to think that, all of us, through our VETERINARY REVIEW, have more or less contributed to these advantageous steps in the right direction, which cannot do otherwise than to bring veterinary medicine to the standing which it ought to claim.

THE SEMI-ANNUAL MEETING of the United States Veterinary Medical Association, which was held lately in Boston, proved one of the most satisfactory that this large body of veterinarians ever had.

Besides the admission of a number of new members and the proposal of many candidates for admission, important business relating to the Association, to the profession, and to the journal published, all of which will be found in our paper in full, an excellent short paper was read by Dr. Charles Peabody of Providence, bringing before the meeting the results of the experience of this gentleman in the use of chloral hydrate as an anæsthetic.

This, we believe new application of this remedy, in active practice, will no doubt be tried by other veterinarians, and we hope they will not hesitate to give us information as to the results obtained. If the advantages that Dr. Peabody reports can be realized also by others, the probabilities are that many means of restraint will be put aside to be replaced by this new but simple mode of controlling the struggles of animals during surgical operations.

AMONGST the contents of this number will be found a paper on diseases of the posterior abdominal aorta and its branches, which was read before the New York Pathological Society.

Illustrating the symptomatology of the disease as it presented itself in the two horses thus affected, it also gives the lesions which were found at the post mortem, and illustrates well the powerful resistance of animals to diseased processes.

HORSE VARIOLA—An outbreak of this disease has been reported as extensively prevailing in Canada, and principally in Montreal. A paper on this subject, as observed in the Montreal Veterinary College by Mr. F. Torrence, veterinary student, as well as one from Prof. McEachran, will be found in full in our pages.

THE REPORT of the Minister of Agriculture for the Dominion of Canada has been sent to us by Prof. McEachran. It contains from the pen of the Professor an excellent article on the cattle trade, embracing the regulations of quarantine for the different contagious diseases, and also a series of investigations in relation to some of those diseases, viz: Tuberculosis, anthrax, etc. The report is completed by an article on contagious pleuro-pneumonia, as prevailing in the United States.

TRANSLATIONS FROM FOREIGN PAPERS.

GOURME; OR, HORSE VARIOLA.

NATURAL AND IRREGULAR FORMS OF THIS DISEASE—INOCULATION AS
A PROPHYLACTIC MEANS OF ITS COMPLICATIONS.

BY M. L. TRASBOT.*

(Continued from page 474.)

VII.

Amongst all possible complications of gourme, undoubtedly the most common are the inflammations localized in the respiratory apparatus. They are so frequent, that they have often been seen alone amongst the pathological phenomena connected with the development of the disease, and that they have been considered as constituting it entirely in the majority of cases. There is no classical work or periodical publication, where it has been considered differently. Always leaving aside or failing to observe the fundamental fact, the accessory has been noticed, and thus, under the name of gourme, almost all anginæ, bronchitis, and pneumonia of young animals have been described.

* Translated by A. Liantard, M.D., V.S.

Hence have been made: a benign, mild or serious gourme according to the severity of the general symptoms, when it seems to consist only in a simple laryngo-pharyngitis, with or without intermaxillary abscesses; and by opposition, a malignant gourme, when the localization consisted in bronchitis, and specially pneumonia; this last most commonly terminating by purulent and gangrenous formations in the pulmonary tissue.

It is resting on this error, still much accredited, that notorious authors have affirmed that an animal could have the disease several times.

Indeed, it is not rare to see inflammation taking hold of the same tissue more than once. Clinical observation has shown long ago that any inflammatory disease may leave behind itself, in many cases, and for a long time, a kind of irritability in the organ affected, which renders it more susceptible to disease. Angina, bronchitis, pneumonia, etc., then give, in fact, to a sick animal a true predisposition to contract those same diseases. In such a way that a disturbing cause given, as, for instance, exposure to cold, which ought to have produced only a slight effect on a robust animal, and previously free from a similar affection, might become sufficient, on the contrary, to develop it in another, which ordinarily would have had one or several attacks.

Can it be, then, surprising that some horses would present new attacks, more or less numerous, of catarrhal affections of the air passages. But it does not prove that they had gourme at so many times. Even if the first manifestation had been certainly a complication of gourme, it does not follow that the others must be of the same specific nature.

Generally, that disease affects animals but once. Second attacks are exceptions, very rare, and in all cases as mild as those of human variola.

Mr. Charles Martin, in his series of observations gathered during 15 years, says, "I have never been able to observe a horse which had gourme twice; I am convinced of the *non*-recidivity of that disease."

This is an opinion expressed by a practitioner of large practice and extensive observation, and thus has considerable

value. We can then accept the principle that a first eruption of gourme gives an immunity for life to all animals thus once affected ; this is of capital importance to the point of view of the practical utility of its inoculation.

But if gourme does not return, it cannot be the same, as I have said, for the catarrhal affection which may complicate it.

As well as those, whose origin is not specific, they predispose the mucous membranes where they were developed, to a return of the inflammation. And this is how their reappearance, so often observed, during four or five consecutive years on the same animal, has caused the belief that they were successive manifestations of true gourme, whose specific character had not been sufficiently observed.

However, the so common repetition of these affections constitute, besides their proper serious character, a sufficient reason for trying to prevent their primitive development at the time of the variolic eruption.

It is useless to describe them—they are too well known. They ought all to be considered as complications of gourme.

I will only say a few words of their gravity, and afterwards look into their causes to conclude from these to the means of avoiding their action.

Angina, with sub-glossal abscesses, is both the most frequent and the mildest of all gourmy affections localized in the respiratory apparatus. In the majority of cases it terminates regularly, without compromising the life of the animal nor his special qualities.

I believe that it is an error to say that it may be followed by permanent roaring. Though closely watching for it, I have never met with it. Altogether, this condition of gourme represents pretty well what was called the benign form.

Still, rare exceptions may be met with to the general rule. When the local phenomena are very intense, animals may be threatened with asphyxia, and die in a very short time. Again, as a consequence of the facility with which pus forms itself in every part of the body, deep abscesses of the throat, of the walls of the pharynx, may be developed and be followed by the same result.

Bronchitis, less common, is, on the contrary, more serious ; first, on account of its longer duration, of the debility it produces, and also of some consequences that may follow.

When it lasts long, it sometimes gives rise to pulmonary emphysema. By the repeated efforts of coughing, a certain number of pulmonary lobules are torn, and the air escapes into the interlobular connective tissue.

It is also often followed by chronic roaring. I have observed several cases of it. This frequent complication induced me to look into its cause, and I believe I have found it.

In 1853, and later, in 1864, M. Goubaux made it known as one of the constant lesions of chronic roaring, the atrophy of the laryngeal muscles on the *left side*. After numerous researches he failed to meet an exception to that rule. He always found those muscles and the nerves which distribute in them in an advanced stage of atrophy. And then in 1868 he explained this phenomenon as follows: "The left inferior laryngeal nerve passes on the anterior face of the trachea, while the right is situated more deeply; therefore, in animals which in harness carry a too narrow collar, there must be a constant pressure on the left nerve, and as a consequence its paralysis can be explained."

Some days after this, Gunther, Jr., in a letter to Mr. Bouley, stated that since 1834 his father had published in a paper on causes of roaring, 1st, that the section of the inferior laryngeal produced roaring immediately; 2d, that 95 times in 100 the muscular atrophy existed on the left side of the larynx; he objected to the theory of Goubaux in saying that a great number of saddle-horses became roarers though they never had a collar; and expressed the supposition that the atrophy of the left recurrent might be due to a rheumatic influence.

The theory of Goubaux seemed to be satisfactory, and became the object of a revindication for priority. Mr. Colin claimed it also. However, it was accepted. Two anatomists and physiologists gave it their approbation. Mr. Colin added that the atrophy of the nerve might be due to its relations with the bronchial ganglions. Dupuy had mentioned this fact also.

Still, from the day when Goubaux had called the attention to that lesion proper to chronic roaring, I examined the larynx of all the roarsers which died in my service. I never failed to meet the same lesions.

But later, having heard that saddle-horses were commonly affected, though they never had a collar on their neck, and also that it was commonly seen after an attack of bronchitis complication of gourme, I came to the conclusion that there must exist, in many cases at least, another mechanism for its development.

I first remarked that in all the anatomical researches I made the inferior laryngeal nerve was not only atrophied from the base of the neck at a point where it would have been compressed by the collar, but in its whole length from its origin. Again I observed, as indicated by Colin and as described by Chauveau and Arloing, that the left laryngeal leaves the pneumogastric farther back than the right, on a level with the roots of the lungs, and then twists round behind the cross of the aorta. There it is interposed between this vessel and the large ganglionar mass of the bronchia, which may compress it against the artery.

And again, I observed in many post-mortems of roarsers that this nerve, surrounded by the ganglions indurated or transformed by any kind of neoplasm, was precisely atrophied from this point, and was reduced from there to the condition of a thin, greyish thread up to its end. I have preserved one piece amongst many, illustrating this condition.

I was then brought to the conclusion that the pressure of the bronchial ganglions had a great influence on the production of roaring; was, perhaps, the exclusive cause of the atrophy and of the left laryngeal mneules.

It is thus that I explained to myself the frequent persistency of roaring after bronchitis of gourme, as it is known that all the inflammatory complications of gourme are accompanied more so than the simple inflammation, by large swellings of the lymphatic ganglions. Externally they generally suppurate, but when deep they seldom undergo this change, in such a way that after four

or five weeks the bronchitis of gourme is cured, the nerve may be sufficiently atrophied under the influence of the compression made by the enlarged ganglions to have lost its functions; the animal is a roarer.

Is there another mechanism? I do not know. But I am brought to accept this by the minute anatomo-pathological observations that I have made.

From these considerations it results that bronchitis is a complication of gourme, not only a serious affection *per se*, but also dangerous by the almost fatal result above mentioned.

Many observations could I mention to demonstrate it. One significant will be sufficient. A handsome percheron stallion, perfectly healthy, was presented to the Universal Exhibition of 1878. While there he contracted gourme, complicated with bronchitis, which lasted six or seven weeks, after which he was a confirmed roarer. Three months later he was in the same condition.

For me there remains no doubt that many cases of roaring take place in that manner. Therefore, I advise the veterinarians who practice in the breeding districts or who may have opportunity of gathering good observations on that subject, not to neglect them, and thus bring important facts likely to completely elucidate the question.

As to pneumonia, it is the most serious of all the gourmy complications. Whether lobar or lobular, almost always it terminates by suppuration and gangrene, followed by death. The purulent collections have often, wrongly, been considered as old lesions. On the contrary, they are developed in very short time. In animals which may have died after four or five days of sickness they may already be very large and numerous; an important fact which must not be overlooked when one is called to judge as to the date of a pulmonary disease.

It is not the presence of pus in variable quantity which characterizes the old existence of the affection, but only the fibroid induration. I have no desire to describe at present those anatomical lesions. I may only notice the frequency of one amongst them in the very recent pneumonia of gourme.

This, in the rare circumstance, when it gets well, must have for its result, as much as bronchitis, to produce roaring. Since the time when my attention was called to this subject, I have seen it often. All these complications of gourme, angina, bronchitis, and pneumonia are occasioned by the external influences which were in old time considered as sufficient causes of the true disease. These are the exposures to cold, the emigration, &c., which I have already discussed, and upon which I will say no more. When they act upon an animal contaminated already and under the influence of the disease, in the incubative or eruptive stage, they give rise to the appearance of these complications because they interfere, and prevent more or less, the natural development of the disease.

(To be Continued.)

SOCIETY MEETINGS.

MEETING OF THE UNITED STATES VETERINARY MEDICAL ASSOCIATION.

The seventeenth semi-annual meeting of the United States Veterinary Medical Association was held at Young's Hotel, Boston, Mass., on Tuesday, March 16th, 1880. At the meeting of the Comitia Minora, held at 11 A. M., there were a number of names proposed for membership. The subject of altering or amending Article 4, Section 1, of the By-Laws was discussed, and referred to the regular meeting.

At the regular session of the Association quite a large number of gentlemen answered to their names. The Secretary, Dr. A. A. Holcombe, being absent, the Society chose C. B. Michener to act in that capacity during his absence. The following gentlemen were elected as members of the Association: F. S. Billings, M.V., Wm. J. O. Sullivan, M.R.C.V.S., Chas. Winslow, V.S., Wm. Zuill, D.V.S., Walter H. Hornblower,

D.V.S., Edgar P. Wing, D.V.S., Hubert F. Foote, D.V.S., Thos. C. Cowhey, D.V.S., and Geo. H. Bailey, D.V.S. On account of some little irregularity in the application for membership, the names of Robt. Simmen and E. P. Smithers were laid over until the next meeting. The names of Thos. Blackwood, W. H. Lillyman and Chas. R. Wood were proposed by members present. Their credentials will be placed before the Board of Censors at the next regular meeting.

A Library Committee, Committee on Intelligence and Education, on Diseases, Finance, and Prizes were then appointed by the chair. The "Resolution Committee," that was appointed at the last annual meeting to petition Congress in relation to contagious diseases, reported progress.

Dr. Liantard then stated the condition of the American Veterinary Review, which is very flattering. Its circulation is increasing, it is not only free from debt, but has a small amount of funds to its credit. The propriety of paying small sums (not to exceed twenty-five dollars) for original contributions to its columns was left to the discretion of the editor and his associates.

Dr. Peabody then read a paper on "Chloral Hydrate as an Anaesthetic in Operations." The essay was well discussed and ordered to be printed in the Review. The Association unanimously extended to the essayist a vote of thanks. Reports of cases, with a general discussion on embolisms, soundness and spavin followed.

Ample justice being done to the sumptuous dinner, for which our Boston friends are famous, the Association adjourned one of its most pleasant and profitable meetings.

C. B. MICHENER, *Sec. pro tem.*

MONTREAL VETERINARY MEDICAL ASSOCIATION.

The usual fortnightly meeting of the above Association was held on Thursday evening last, March 4th, Mr. C. J. Alloway, V.S., in the chair.

The members expressed their pleasure in seeing Mr. Alloway once more among them, after recovering from his late severe illness.

The following resolution was also passed: "Moved by Mr. Wm. McEachran and seconded by Mr. J. B. Green, that this Association deeply regret the untimely death of the late John S. Thomas, an active and earnest member of the Association, and much respected by his fellow-students. The circumstances of his death are peculiarly sad, and we sincerely sympathize with his sorrowing family in their sad bereavement."

Mr. William Jakeman, Boston, Mass., read an interesting report of a case of cerebral meningitis in a horse treated by him under the direction of Professor McEachran. The symptoms described were those of dullness, stupidity, nervous twitchings, gradually increasing to complete stupor, alternated by violent fits of excitement, pressing the head into a corner, delirious movements, during which galloping was simulated.

The treatment consisted in laxatives—large doses of bromide of potassium, and in the later stages *nux vomica*. At the outset cold applications to the head, subsequently changed to counter irritation.

The recovery is not complete. Though nearly well, slight nervous twitchings continue.

Mr. Peter Cummings, Quebec, read an interesting paper on auscultation and percussion as diagnostic aids in veterinary practice. Mr. Cummings described the various sounds discovered on auscultating and percussing or tapping the chest. He said it was impossible for any one to hope to be able to examine diseased lungs or heart, unless they were perfectly familiar with the sounds emitted by healthy organs. None of the lungs or heart sounds could be recognized from description any more than any particular musical instrument or any individual tone of that instrument; they must be listened to both often and carefully. He would, therefore, urge upon all students never to miss an opportunity of examining the respiratory and circulatory organs whilst at college, when they could do so under the supervision of their clinical teachers. However well versed they might be in physiology and

pathology, unless they could readily recognize a healthy from a diseased note, they would have wasted many valuable years. It was absolutely essential to every practitioner's success that auscultation and percussion should be to him really and truly *diagnostic aids*.

In the discussion that followed, Dr. James Bell, Surgeon of the Montreal General Hospital, fully corroborated Mr. Cumming's views as to the necessity of becoming familiar with all chest sounds. He, in a few well-chosen remarks, gave the students some valuable ideas on the subject.

After a vote of thanks to the essayists, the meeting adjourned till March 18th, when papers by Mr. E. J. Carter and Mr. Donald Campbell will be read.

HORSE-POX—VARIOLA EQUINA.*

BY D. McEACHRAN, F.R.V.C.S.

SIR.—My attention has been called to numerous paragraphs which have appeared in Canadian and American newspapers referring to the epizootic disease at present prevailing in the city and vicinity, containing statements which are incorrect and calculated to cause alarm among horse-dealers, which is altogether unnecessary. The disease is unquestionably *variola equina*, or horse-pox; it is similar in its nature to vaccinia or cow-pox; it has no connection with small-pox of man, other than being a variolous disease, that is to say, when man is inoculated by the virus of horse-pox, small-pox is never produced, its effects on man are exactly the same as vaccination, and has the same protective power against small-pox.

Horse pox and cow-pox differ from small-pox by the exanthemata being in all cases purely local; instances of its involving the entire body are extremely rare in the horse; the eruptions are confined to the heels and pasterns, occasionally extend-

*From the Gazette, of Montreal.

ing up the legs ; seen also on the muzzle, mouth and nose, groin and perineum, and in a few instances diffused over the shoulders and loins. In cattle it is almost invariably confined to the udder.

Jenner, the great discoverer of vaccination, one of the most important advances in medicine, was of the opinion that cow-pox was often due to the accidental transmission of the virus of the horse to the udder of the cow from the hands of a milker who had been taking care of horses suffering from variola.

Cruselman says: "The horse-pox very probably can be inoculated upon the human subject with the same effect as vaccination, and the practice is objected to merely because horses have other kinds of sores upon the foot print which occasion disagreeable mistakes sometimes."

On this subject I might remark that both during the epizootic of this disease in 1877 and the present winter, I have invariably urged the grooms not to fear inoculation, as their being susceptible to it indicated their susceptibility to small-pox, and that if they became inoculated it would in all probability protect them as surely as vaccination would. From observation in half a dozen cases of inoculation of grooms, four on the hand and two on the face, I am convinced that the results are identical with vaccination. Two or three days from the time of inoculation the part becomes red and slightly swollen, a sympathetic swelling also extending up the arm to the axilla when in the hand, accompanying which there is a slight fever. By the fourth day a single vesicle forms containing clear lymph, which enlarges till about the seventh day it attains a diameter of an eighth of an inch, and gradually becomes opaque. About the tenth day it is yellow, and the surrounding tissues are swollen and red. It now gradually begins to desiccate, beginning in the centre ; the scab thickens and dries and becomes of a dark brown color, and about the seventh day it is thrown off, leaving a scar similar in every respect to that seen from vaccination.

With regard to the causes of this disease, it may be difficult to account for it. During a residence extending over seventeen years in Canada, I have only seen it twice, viz: in 1877 and dur-

ing the present winter. There can be no doubt that it is dependent on some peculiar atmospheric condition, sudden changes of weather, such as have recently prevailed here, or other causes purely local. That it is contagious cannot be doubted, and that it is infectious I am also inclined to believe, but neither contagion nor infection form marked features in the disease. For instance, in the College Hospital, which for several weeks back, has been full of variolous patients, my own horses and half a dozen others have not presented any symptoms of the disease. True, the patients are in loose boxes, and dressed by different persons from the healthy horses. Again, in an establishment of nearly 200 horses, only three or four cases have occurred, while in some stables of two or three horses, all have become affected. That the disease can be carried to a distance and become epizootic I do not believe. Thus, for instance, I do not believe that a horse suffering from variola taken to, say Boston or New York, would introduce the disease to these cities as an epizootic, unless the climatic and atmospheric conditions necessary for its existence and spreading existed there, which is very improbable; consequently no apprehension need be felt on account of it. At most it is merely a temporary inconvenience, necessitating in the majority of cases cessation from work for about three weeks, and, if allowed to run its regular course, unattended by any injurious results. Injudicious doctoring, or keeping the animal at work, may produce sores of the heels affecting the deep tissues, which are sometimes difficult to heal.

I may further add that whatever the cause has been, it seems to have exhausted itself, as the disease is rapidly disappearing. Very few new cases are occurring, and most of those laboring under it are returning to work.

D. McEACHRAN, F.R.C.V.S.

Inspector of stock for the Dominion Government.

THE SUPPRESSION OF CONTAGIOUS DISEASES AMONG OUR DOMESTIC ANIMALS.

BY F. S. BILLINGS.

It is certainly encouraging to the members of the veterinary profession to see indications of a movement in this direction in Congress. It should mean professional advancement in the right direction. Veterinary medicine finds its strength and gains public appreciation, not like human medicine, in the gratitude of the patient or his family, but in its ability to prevent, in a measure, individual or great national losses, and, what is still more important, its ability to prevent many serious diseases or unpleasant disturbances to the human organism. In other words, from the appreciative point of view, veterinary medicine is strong where human medicine is weak, and *vice versa*. It is of the utmost importance and interest to every public-spirited veterinarian that no serious mistakes be made in the formation of the so-called "Commissions" for the suppression of the diseases in question. What the profession desires, is advancement, as a whole, in public appreciation. In the appointment of Commissions, or, rather, in the manner they have thus far been conducted, this end has been most signally lost sight of. The veterinarians who have been appointed to these positions have so conducted themselves as to magnify themselves and the Commission before the public, but the profession as a whole has gained nothing thereby. In Massachusetts we have had a "Cattle Commission" for some seventy years, but the *whole* work which has been done has been done by them, and no endeavor has ever been made to elevate the profession into notice by appointing, or seeking to appoint, local veterinary inspectors over the State, so far as the forces at their command would allow. In New York and New Jersey it is the same thing. The Commission would be all in all, and the veterinarians occupying the prominent positions have done nothing, that is, made no public endeavor, to be said that

such an endeavor could but result in failure—that the authorities were not yet ready for it. To which we answer, that until the attempt has been made in earnest, such an answer is but an evasion of the point at issue. The Massachusetts Commission are very proud, and justly, of the work they did in suppressing contagious pleuro-pneumonia of cattle between 1860 and 1870. But they really overestimate the work they did. They forget that Massachusetts herself was the centre of invasion, and that they had the disease only in Massachusetts to cope with, and were not endangered at all by threatened invasions from adjoining States. Hence, once stamped out, it remained so, which would scarcely have been the case were adjoining States equally invaded. Glanders is a disease very similar in its nature to the cattle distemper, but our Commission is almost powerless to prevent its extension. The work it does in this regard is far exceeded by the S. P. C. A. Association. The reason of this is, that the work is supposed to be done by *one Commissioner*, and the profession at large is utterly neglected, nor does it form any part of the State preventive force. This is the danger the profession would avoid in the appointment of a National Commission. What the profession demands is, that the veterinary incumbent of such a position shall be a man having not only the necessary technical qualifications, but also one who will entirely forget himself, save that he will put his entire *self* into the work of making evident to the people the value of the profession, by endeavoring to organize as efficient a veterinary police as circumstances will permit. Two different bills have been presented to Congress, proposing a Commission for the purposes in question; one by a Mr. Kiefer and the other by a Mr. Lefevre. It is the purpose of this paper to call the attention of the profession, as well as the readers of the *Turf*, to the different plans of organizing said Commission in these two bills. Mr. Kiefer proposes that the Commission be composed of a practical stock-raiser, a civilian (who should be an able lawyer) and a veterinarian. That of Mr. Lefevre proposes that the Commission be composed of the Commissioner of Agriculture and the Secretaries of Treasury and State; *this board to employ a veterinarian*. It should be evident to every veterinarian that this

last proposition deserves not only condemnation, but bitter opposition from every true member of our profession. Who of us is willing to play advisory fiddle to these three moguls? I, for one, certainly am not. (Better wait until I am asked? says some one; but I don't intend to.) In Mr. Kiefer's plan the veterinarian stands on an equal footing with the other members of the Commission. He is a man—a servant of the people—not a tool, depending for his position upon political favoritism alone.

What *man* of us is willing to take any public position upon such terms? Certainly no one with a particle of self-respect or professional pride! What reward does it offer for work of the most arduous and responsible kind? Here we are at the close of an administration. What kind of a man does the honorable member from Ohio think can be obtained, willing to give up a lucrative practice, to take a public position for the brief period of one year, or, what is still more damnable, to take it subject to the will and sweet pleasure of three government officials and political wire-pullers? Such a proposition as this of Mr. Lefevre is nothing else than demoralizing and insulting to our profession. Better no Commission at all than one by which the veterinarian is proposed to occupy so subordinate a position.

Our profession should represent a scientific body of men. Science is not bought and sold. She does not stoop, nor do her advancing sons, at the feet of men almost ignorant of the alpha and omega of her mission. Unless our representative can occupy an equally honorable position with any other member of the Commission, the Government should go begging for such an incumbent.

When will the day come that our Government will appreciate science and do something for her advancement? If Congress should pass either of these bills, it is to be hoped that this position will be made equal to any other on the Board, and second that it will be thrown open to the profession for public competition, theoretical and practical; by this we mean autopsies of diseased animals, with oral demonstrations of the results. Unless this practical side is strictly observed, some book-worm might get the position, whose only fitness would be that of a *parrot*—to

repeat what others had said ; and thirdly, the successful candidate should receive the appointment for at least ten years ; otherwise, I do not know a man who could afford to take the position for \$4,000 per year, as proposed by Mr. Kiefer, and give up a successful practice.

It is a disgraceful characteristic of our National as well as State Governments that, so far as suitably rewarding the work of scientific men, they are *dead beats* in comparison to the world at large. They seem to think that the "honor" pays. They forget that "honor" and starvation wages do not find bread and butter for wife and children, or supply the means for a comfortable old age.

Civil service reform, moderate pay, and pensioning on retirement is the only way by which a Government can ever hope to procure the services of really able scientific men.

To my colleagues of the veterinary profession, I have this word to say : Do not undervalue the truth of my words, that it is of the utmost importance to us as a profession, and to our future as well, that this position be filled by a man who will work to bring our profession into prominence ; who will, while making a name for himself, do it by working entirely in the interests of the profession and the people. The plan proposed by Mr. Lefevre is crude in the extreme. It is nothing more or less than our old "Commission" over again—a one-man power. State veterinarians are to be hydra-headed monsters, or mediums, all over the State at one time. It knows nothing of local veterinary officers. Owners are to report cases to the Governor of the respective State, who is to send the State Veterinarian to investigate the case. Poor fellow ! It will be hard if four or five notices, in as many distant parts of the State, should be sent in at once. Like a bee in a bucket, he would scarcely know which way to go to get out of the scrape.

The plan of Mr. Kiefer, or a somewhat similar one, is far more likely to lead to favorable results. Let us learn to hasten slowly—to look before we leap. One wonders who advises our wise legislators on the question. Why not invite three or more representative members of our profession to Washington, pay

them properly, and have them give their opinion? None of us differ so much that we could confound any committee by our varying testimony. And, finally, pleuro-pneumonia *will not be stamped out* of this country in the way proposed, but will slowly and surely extend over the country until it costs us millions every year, unless the profession at large be called in to take part in the work, and even then it is very doubtful if we are successful. Again, all these men propose is to combat pleuro-pneumonia. How about other contagious animal diseases? Have we none? My colleagues, you are by far too modest. You leave this work of educating the public, of correcting abuses, of watching the signs, too much to a very few men. Some of you can certainly write. Then up, men, and do your duty! Nothing leads sooner to the discovery of the truth than honest, open discussion.—(*From Turf, Field and Farm*).

OBITUARY.

The veterinary profession in France has recently lost one of its oldest and best members—M. T. Lecoq died the 14th of last month, when nearly 75 years of age. Late professor and director of the veterinary school of Lyons, and then general inspector of the French veterinary schools, the highest position of the professional hierarchy in France, he was the author of many excellent works, amongst which one, the “*Treatise on the External Form of the Horse, and of the principal Domestic Animals*,” was entering on its seventh edition.

ARMY APPOINTMENTS.

Mr. James Humphries, V.S., graduate of Ontario Veterinary College (1878), has been appointed Veterinary Surgeon to Second U. S. Cavalry, and is now stationed at Fort Custer, M. T.

DONATIONS TO AMERICAN VETERINARY COLLEGE.

SPECIMENS PRESENTED TO MUSEUM.

- 174, 175. Ulcerated and Necrosed Navicular
Bones.....Prof. A. Liantard.
- 176, 177. Fracture at the Coxo-Femoral
Joint.....J. C. Myers, Jr., D.V.S.
178. Large Intestinal Calculus.....J. C. Myers, Jr., D.V.S.
179. *Dochmius Trigonocephalus*—right
heart of black-and-tan dog.Theo. Outerbridge, D.V.S.
- 180, 181. Arthritis of Elbow Joint....J. C. Myers, Jr, D.V.S.
182. Longitudinal Comminutive Fracture of
the Radius.....S. S. Field, D.V.S.
183. Jabot in Cow.....C. B. Michener, D.V.S.
184. Comminutive Fracture of the Metatar-
sal Bone.....W. H. Wray, D.V.S.
185. Wall Eye of an Ox.....H. B. Herr, D.V.S.
186. Bones of a Calf, dead in utero.....H. B. Herr, D.V.S.

BOOKS PRESENTED TO LIBRARY.

BY PROF. A. A. HOLCOMBE.

- 1 vol. "Yonatt on the Horse, with Treatise Draught."
- 1 vol. E. Lankester, M.D.—"Half Hours with the Microscope."
- 1 vol. A. Flint, Jr., M.D.—"Chemical Examination of Urine."
- 1 vol. H. Roscoe—"Elementary Chemistry; Inorganic and
Organic."
- 1 vol. W. Burke—"Compendium of Anatomy, Physiology and
Pathology (1806)."
- 1 vol. J. M. Woodworth, M.D.—"Cholera Epidemic of 1873
in the U. S."
- 1 vol. J. Gamgee—"Reports on Diseases of Cattle in the U. S."

-
- 4 vol. —————“ Report of Department of Agriculture,
1874, 1875, 1876, 1877.”
- 1 vol. Grover Coe, M.D.—“ Concentrated Organic Medicines.”
-

BY PROF. A. LIAUTARD.

- 1 vol. Investigations of Diseases of Swine, and Infectious and
Contagious Diseases of Domesticated Animals.
- 1 vol. Annual Report State Board of Health (Rhode Island).
- 1 vol. Memory of Doctor Val. Mott.
- 1 vol. Transactions New York Pathological Society.
- 1 vol. Report of the Minister of Agriculture for the Dominion
of Canada.
- 1 vol. Report Board of Agriculture (Connecticut).
- 1 vol. Chauveau's Anatomie Comparée.
- 1 vol. Blaine's Veterinary Art.
-

EXCHANGES, ETC. RECEIVED.

HOME EXCHANGES.—American Agriculturist, Prairie Farmer, Medical Record, Turf, Field and Farm, Medical and Surgical Reporter, Scientific American, The Physician.

FOREIGN EXCHANGES.—Revue fur Thierheilkunde und Thierzucht, Gazette Medicale, Recueil de Medecine Veterinaire, Veterinary Journal, Veterinarian, Clinica Veterinaria, Revue Dosimetrique, Revue d'Hygiène.

JOURNALS AND PAPERS.—Montreal Daily Star, Gazette (Montreal), Philadelphia Inquirer, Tribune and Farmer, of Philadelphia, Journal of Agriculture (Montreal).

BOOKS AND PAMPHLETS.—Report on Pleuro-Pneumonia among Cattle in the State of New Jersey, Report of the Minister of Agriculture for the Dominion of Canada, 1879.

CORRESPONDENCE.—G. Zeuner, V.S., Fred Torrance, B.A.

AMERICAN VETERINARY REVIEW,

MAY, 1880.

ORIGINAL ARTICLES.

UPON VIRULENT DISEASES, AND IN PARTICULAR UPON THE DISEASE VULGARLY CALLED CHICKEN CHOLERA.

BY M. PASTEUR.

Virulent diseases are counted amongst the greatest scourges. To be convinced of it, one has only to name measles, scarlet fever, small-pox, syphilis, glanders, yellow fever, typhus, cattle plague, etc., etc. This list, already so loaded, is far from being complete. All the great pathology is there.

As long as the ideas of Liebig upon the nature of ferments prevailed, the various forms of virus were considered as substances thrown into an intestinal motion, capable of communicating itself to the materials of the organism, and of transforming them into virus of the same nature. Liebig knew that the occurrence of these ferments, their increase and their power of decomposition, have a startling resemblance with the phenomena

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of life; but he said in his *Treatise of Organic Chemistry* that this was only a deceiving mirage.

All the experiments that I have made for the last twenty-three years have tended, directly or indirectly, to show the inexactitude of the opinions of Liebig. From the beginning, that is about 1857, a method almost unique has served me as a guide in the study of microscopical organisms. It consists essentially in the culture of these little beings in their pure, original condition, unaffected by any of the heterogenous matters, living or dead, which accompany them. In using this method, the most difficult questions sometimes receive easy and definitive solutions. I will recall one of the first applications I made of it: Ferments, said Liebig, are all those nitrogenous compounds of the organism, fibrin, albumen, caseine, * * * in the state of alteration that they undergo by the effect of the contact of air. Fermentation, in fact, is not known where such compounds are not present and active. Spontaneity was claimed all over as the originating cause of the inception and march of fermentation as in those of diseases. In order to demonstrate that the theory of the learned German chemist was, to use his own words, only a "deceiving mirage," I employed artificial media, containing only pure water, with the mineral substances necessary to life, fermentable matters and the germs of ferments of those different matters. In those conditions, fermentations took place with a regularity and a purity, if I may so say, which did not always exist in the natural spontaneous fermentations. All albumenoid substances being left aside, fermentation developed as a living being, which borrowed from the fermentible elements all the carbon of its successive generations and from the mineral medium the nitrogen, phosphorus, potassium, magnesium, elements whose assimilation is one of the necessary conditions of the formation of all beings, great or small.

Thus, not only was the theory of Liebig proved without foundation, but the phenomena of fermentations presented themselves as simple phenomena of nutrition, taking place in exceptional conditions, amongst which the most strange and significant no doubt, is the possible absence of the contact of air. Human

as well as Veterinary Medicine, saw the importance of these new results, and researches were especially made to determine whether the virus and contagia in question were not animated beings. Davaine (1863), labored to bring up in evidence the functions of the bacteridæ of anthrax, which he had seen in 1850; Chauveau (1868), tried to prove that virulency was due to the solid particles previously discovered in all virus; Klebs (1872) attributed traumatic virus to organisms; Kock (1876), by the method of culture, obtained the corpuscle germs of bacterides, in every point like those I had already demonstrated for vibrios and the etiology of several diseases was found to be due to the existence of microscopical ferments. To-day, the most rebellious objectors to the doctrine of the germ theory are doubtful. But what obscurity yet remains on several points? In the great majority of virulent diseases, the virus has not been isolated, still less demonstrated alive by the method of the cultures, and everything tends to show from those unknown proofs of pathology, the existence of mysterious morbid causes. The history of the diseases they give rise to, presents also extraordinary circumstances, amongst which must be first named the obscure one of *recidivity*.* What a strange circumstance! Scarcely from this fact would imagination hazard a hypothetical explanation resting on some experimental basis.

Is it not surprising to observe that vaccine, a virulent disease by itself, but benignant, protects not only from itself, but also from a most serious disease, small-pox?

These facts are known since the oldest antiquity, for variolization and vaccination are practices known in India from immemorial times, and when Jenner demonstrated the efficacy of vaccination, country people, amongst whom he practiced, knew that cow-pox protected from variola. This fact of vaccine is unique, but that of the non-recidivity of virulent diseases seems general. The animal organism is not twice affected with measles, scarlet fever, typhus, variola, syphilis, * * * at least immunity lasts for a variable length of time.

* A second attack.

Though realizing the propriety of a becoming humility in presence of these mysteries, I hope that the society will see in the facts I have the honor to present, unexpected explanations of the problems presented by the study of virulent diseases.

Sometimes in poultry yards, a fatal disease known as *chicken cholera* makes its appearance. Thus affected, the animal is weak, staggering, its wings dropping, its feathers staring. If forced to open its eyes, it seems to wake up from a deep sleep, and soon returns to this condition until death takes place in a comatose agony, and almost without a struggle. The internal lesions are extensive. The disease is produced by a microscopical animal which, according to Zundel, had been suspected first by M. Moritz, later, better described in 1878 by Perroncito, and as late as 1879 by Toussaint, who has demonstrated by the culture of the little organism in neutralized urine, that it was truly the cause of the virulency of the blood.

In the study of microscopic-parasitic diseases, the first and most useful condition to fulfil is to have a liquid where the infectious organism can be easily cultivated and always without a possibility of mixture with other organisms of different species. Neutralized urine, with which I was so successful in proving that the culture of the bacteridæ of Davaine was certainly the virus of anthrax, was bad for this double object. But the bouillon of muscles of chicken, neutralized by potash and rendered sterile by a temperature above 100 degrees (110 to 115 degrees,) forms a medium for culture well adapted to the life of the microbe of chicken cholera. The facility of the multiplication of the microscopic organisms in this medium is prodigious. In a few hours, the clearest bouillon becomes turbid, and is filled with a larger number of small bodies, extremities fine, slightly strangulated in the middle, so that at first sight they look like isolated points. These bodies have no proper movement. In a few days, already so small when in the way of multiplication, they increase in number, and form a multitude of points so reduced in size that the liquid of culture, turbid at first, so as to look milky, becomes scarcely cloudy by the presence of smaller points, rigorously unmeasurable, so small is their diameter. This microbe certainly

belongs to a different group than that of the vibrios. I imagine it will take its place at a future day with the virus yet of unknown nature, when, as I hope they soon will be, these last virus will have been successfully cultivated.

The culture of our microbe presents very interesting peculiarities.

In my preceding studies, one of the media of culture that I have utilized with the most success is the decoction of hops-yeast (*levure de bière*) with water, filtrated to a state of perfect limpidity, and then rendered sterile by heat above 100 degrees. The most varied microscopic organisms do well in this liquid, specially if it is neutralized. For instance, the bacteridæ of anthrax grow in it in a few hours, in a surprising manner. It is a surprising fact that the medium of culture is quite fatal to the life of the microbe of chicken cholera; in less than forty-eight hours it dies. Is it not this that is observed when a microscopic organism remains inoffensive to an animal species upon which it has been inoculated? It is inoffensive, because it does not develop in the body of the animal, or because its development does not reach the organs essential to life.

The sterility of yeast, sown with the microbe, offers a precious mean of recognizing the purity of the cultures of this organism in the bouillon of chicken. A pure culture, sown in yeast, gives in it no development; the yeast remains limpid. On the contrary, it becomes turbid, and cultivates by the organisms of impurity.

I pass now to a still more singular peculiarity of the culture of the microbe of chicken cholera. The inoculation of this organism to Guinea-pigs does not produce death as surely as in chickens. In those animals, of a certain age especially, one observes only a local lesion at the point of inoculation, which ends by an abscess of various size. After opening spontaneously, this closes up and gets well without the animal losing its appetite, or exhibiting any of the signs of disturbed health. Sometimes these abscesses last for several weeks before suppurating, surrounded by a pyogenic membrane, and filled with creamy pus where the microbe swarm alongside the pus corpuscles. It is the

life of the inoculated microbe which gives rise to the abscess, which becomes, for the small organism, as a closed vase where it is easy to obtain it, even without killing the animal. It keeps there, mixed with the pus, in a great state of purity and without losing its vitality. The proof of it is that, if one inoculates chickens with a little of the contents of the abscess, these chickens die rapidly, while the Guinea-pig, which has furnished the virus, gets well without the slightest suffering. One sees, then, a localized evolution of a microscopic organism which stimulates the formation of pus and of a closed abscess, without producing internal disorder, nor the death of the animal upon which it is met, and always ready at least to carry death to other species to which it is inoculated; always ready even to kill the animal in which it exists in the state of abscess, if such circumstances more or less fortuitous, cause it to pass in the blood or in splanchnic cavities. Chickens or rabbits living with guinea-pigs having such abscesses might become suddenly sick and die, and still the health of the guinea-pigs seem to remain perfect. For this it would be sufficient that the abscesses of the guinea-pigs, ulcerating, should throw a little of their contents on the food of the chickens and rabbits. Witnessing these facts, and ignorant of the connections I am relating, an observer would be surprised at the death of the chickens and rabbits without apparent cause, and would refer it to the spontaneity of the disease; as he might not believe that it would have started from the Guinea-pigs, all in good health, and especially if he knew that this specie of animals is, itself, subject to that disease. How many mysteries in the history of contagions will one day receive solutions still more simple than the one I am speaking of!! Let us throw aside the theories, that we can contradict by positive facts, but not by the vain pretext that some of their applications escape us. The combinations of nature are at all times singular and more varied than those which meet the ordinary conceptions of our minds.

One will be better convinced of what I say, if I add that several drops of a culture of our microbe, placed on bread or on meat which chickens will eat, are sufficient to introduce the disease by the intestinal canal, where the little microscopical organ-

isms develop themselves to such an extent that faecal excrements of chickens thus effected, will kill animals inoculated with them. In this manner one can easily understand the manner of propagation of the disease in chicken yards. Evidently the manure of diseased animals plays the greatest part in the contagion. And then nothing will be easier than to stop it by isolating the animals for a few days only, by washing the yard well with water, or water acidulated with sulphuric acid, which easily destroys the microbe and prevents its development, in proportion of 1 gramme of the acid to one litre of water, and by removal of the manure. All causes of contagion would be disposed of, as, during the isolation, animals already diseased would have died, so rapid is the action of the disease.

In passing always from one culture to another by the sowing of a quantity comparatively very small, for instance, by what may be carried on the point of a needle just dipped in the fluid, the repeated culture of the infectious microbe in chicken bouillon does not weaken the virulent power of the microscopical organism, nor, what is about the same, the power of its multiplication in the body of the gallinaceous. This virulency is so great, that by the inoculation of a small fraction of one drop of a culture, twenty times out of twenty death will take place in two or three days, and often in twenty-four hours.

These generalities being known, I now come to the most important facts.

By some change in the culture, the virulency of the infectious microbe can be diminished. This is the important point of this paper. I nevertheless ask the Society the liberty not to trust for the present, too far in my faith in the means which may tend to the diminution I am speaking of, so far as to reserve for a short time the independence of my investigations as well as to insure their progress.

The diminution in the virulency is manifested in the subject by a small stoppage in the development of the microbe ; but at the same time the identity remains of the two varieties of virus.

In the first state, that where it is very infectious, the microbe will kill twenty times out of twenty cases ; under the second it

will give rise to the disease, but not fatally twenty, times out of twenty observations. These facts have an importance easily to be understood; they allow us to judge so far (of the disease which occupies us) the problem of the possibility of a second attack. Let us take forty hens, and inoculate twenty with very virulent virus; they will die. Let us inoculate the other twenty with weakened virus; all will be sick, but will not die. Let us allow these to get well, and inoculate them with very infectious virus; this time it will not kill them. The conclusion is evident; the disease protects itself. It has the character of the virulent diseases which do not attack an organism twice. But be not blinded by the singularity of these results. All in it is not so new as might be at first supposed. They have, however, on an important point, a true and real novelty, which must be exposed. Before Jenner, (and he for a long time practiced this method,) as I have already said, people were variolized, that is, inoculated with variola, to be protected from it. To-day, in some countries, sheep are variolized to protect them from variola; bovine are inoculated with pluro-pneumonia to be protected from that disease. Chicken cholera is another immunity of the same kind. It is a fact worthy of attention, but not new in principle. The true, real novelty of the preceding observations—novelty, which gives rise to much thought in relation to the nature of virus, is that it is a question in this case of a disease, whose virulent agent is a microscopic parasite, a living being, cultivable outside of the economy. The varioloid virus, that of vaccine, glanders, syphilis, &c., &c., are unknown in this special nature. The new virus is an animated being, and the disease it gives rise to has, with virulent diseases so called, this point (so far unknown in virulent diseases with microscopic parasites): the character of protecting from a second attack.* Its existence throws, so to speak, a bridge between the ground proper of the virulent diseases with living virus, and that of the diseases with virus whose life has never been discovered.

I would not wish you to believe that the facts occur with the

* Non-recidivity.

plainness and mathematical regularity that I speak of. It would be overlooking all the variability that exists in the constitutions of animals taken at hazard from a mass of domesticated individuals, and in the manifestations of life in general. No; the very virulent virus of chicken cholera does not always kill twenty times out of twenty; but in the facts which I have seen, it has done so in the minimum eighteen times, when not in twenty. And the weakened virus does not always protect twenty times out of twenty. In my observations it has been eighteen, and once sixteen. A single inoculation is not absolutely always protective. A more certain result can be looked for with two.

If we compare these results with the great fact of vaccine with small pox, we will recognize that the weak microbe which does not kill, acts as a vaccine in relation to the microbe which kills; giving rise, in fact, to a decrease which may be called even mild, and which may protect from one which might be fatal. What would be necessary to convert this microbe of weakened virus into a true vaccine like that of cow pox? It is, if I may so express it, that it should be fixed in its special variety, and that to use it it would not be necessary to always look for it in its state of original vigor and purity. In other words, we are placed in the same doubt as that which for some time occupied Jenner's mind. When he had demonstrated that inoculated cow-pox would protect from variola, he thought it would always be necessary to look for the cow-pox of the cow. We are at present at the same point in relation to chicken cholera, with however this great difference, that we know that our vaccine is a living being. Jenner soon found that he could do without the pox of the cow. We may do as well by carrying out microbæ from culture to culture. Will it then return to a very active virulency, or will this remain limited? Astonishing as they may seem, facts bring us to the second supposition. At least in the small number of successive cultures that we have made, the virulency has not increased, and consequently we may believe that we have to deal with a true vaccine. More than that, one or two experiments are favorable to the idea that the weakened virus remains such in passing in the organism of guinea pigs. Would it be so after

several cultures and several inoculations ! Further inquiries only will solve these questions.

However, we possess to-day a disease with microscopic parasites, which, notwithstanding its parasitic character, we can reproduce in such conditions that it will not recidivate. And besides, we know a variety of its virus which acts towards that disease as vaccine does toward small-pox.

Before going further I may be allowed to enter into a very interesting digression.

From the preceding remarks it results that one can easily cause chickens to be affected with cholera, and death not be a necessary consequence of the disease, or in other words, any supposable number of animals may recover after inoculation, and I do not believe that any surgical clinic has ever noticed more curious phenomena than those which are manifested in the returns to health after inoculations made in the large pectoral muscles. The microbe proliferates in the thickness of the muscle as it does in a medium of culture. At the same time the muscle becomes tumefied, hard, and white on its surface as in its depth. It becomes lardaceous, full of purulent globules, still without suppuration. The histological elements are easily broken, as the microbe which impregnate them alter and destroy them in feeding on their substance. In cases of recovery, the parasite is by degrees stopped in its growth and disappears ; at the same time the necrosed part of the muscle shrinks, hardens and lodges itself in a cavity whose lining resembles much a granulating healthy wound. The necrosed part soon forms a sequestrum so well isolated in the cavity where it is closed, that it is felt under the finger, through the skin, in the thickness of the muscle, and by the smallest incision may be easily extracted. The small wound soon closes and the muscle is repaired. Let me terminate, however, by an explanation which will, no doubt, seem very legitimate, of the fact of the protection given against a second attack of the disease. Let us observe a hen well vaccinated by one or several preceding vaccinations with weakened virus. Let it be reinoculated. What will take place ? The local lesion will be, so to speak, insignificant, relatively to that produced by the first operation. These

will give rise, the first principally, to such great alteration of the muscle that large sequestræ will be felt under the fingers. The cause of the difference in the effects of these inoculations seems to reside entirely in a great relative facility of the development of the microbe after the first inoculations, and for the last, on the contrary, in a non-development, or in a very weak one, rapidly stopped. The consequence of these facts is manifest; the muscle which has been diseased has become after its recovery and its repair, unable fully to cultivate the microbe, as if this last by an anterior culture had removed from the muscle some principle that is not returned by life, and whose absence prevents the development of the little organism. In my mind, this explanation, to which we are brought by most palpable facts, will become probably general and applicable to all virulent diseases.

The explanation that I have given of the protection against a second attack of cholera will seem so much more plausible that, if, after three or four days of culture of the microbe in a liquid medium, this last is filtrated to a perfect limped state, and if it is then sowed again after several days of proof of its limpidity at a temperature of 30 degrees, all cultivation remains impossible. Still the weight of the microbe, formerly developed, was imponderable. Remarkable fact, this filtrated, and thus sterile, liquid is far from retaining this sterility towards other microscopic organisms: for instance, it grows the carbuncular bacteridæ, and this allows us to comprehend why an organism in which a virulent disease does not recidivate, is nevertheless liable to contract a virulent disease of another nature. It would be easy to give anthrax to hens vaccinated for chicken cholera.

It would seem to me superfluous to show the principal consequences of the facts I have just presented. There are two however, which it may not be without utility to mention. First is the hope of obtaining artificial cultures of all the virus; and again, a desire to search the vaccine virus of the virulent diseases which so often have desolated, and again every day desolate humanity, and which are such a great curse to agriculture in the raising of domestic animals.

EDITORIAL.

CHICKEN CHOLERA.

The believers in the spontaneity of the development of contagious diseases have found in M. Pasteur a powerful opponent, who slowly, but surely, demonstrates by undeniable proofs that the virulent properties of those affections is due to the presence of microscopical organisms. A few years ago it was his wonderful discovery of the causes of the contagious disease of the silk worm; later, the evident proof of the bacteridæ as causes of carbuncular affections; and now it is his demonstration of the ætiology of chicken cholera, an affection which destroys so many of our valuable poultry, and brings on ruin to large poultry breeding establishments.

But this last discovery goes farther. With some restrictions, justified by the limited number of experiments yet made, he shows that chicken cholera is not only due to the presence of a microbe, developing itself in the organism of the hen, as was already demonstrated by Perroncito and Toussaint, but that it can be prevented by inoculation—a fact which goes far in the prophylaxy of the disease, and which cannot escape the attention of our agriculturists. Prizes have been offered for proper means of treatment of this affection. We hope that the article which we reprint to-day will find room in the columns of our agricultural papers, and be read and put in practice by those who are engaged in the important undertaking of breeding and raising poultry. Veterinarians will, no doubt, read with interest, the long papers that M. Pasteur read before the Societe Centrale de Medecine Veterinaire, and which we reprint in full in this issue of the REVIEW.

PLEURO-PNEUMONIA.

Our readers are aware that the appointment was made some time ago, by the Commissioner of Agriculture, of Dr. C. P. Lyman, M.R.C.V.S., to investigate to what extent plenro-pneumonia was prevailing in the Eastern States.

As soon as he was appointed, in February last, the Doctor set himself to hard work, and has no doubt well employed his time, if we can judge by the extracts from the report which was sent to us, and which we reproduce in the *REVIEW*.

This is, properly speaking, the first official paper that the profession has read, and the first also which presents to all the true state of affairs relating to that cattle lung disease; and when one reads it, if he takes into consideration the amount of good work done by the different State Commissions, in the shape of stamping out, and adds to it the remaining existing condition, can he wonder any longer at the anxiety expressed by our Government or that of Canada and of England.

Let now the Commissioner of Agriculture direct Dr. Lyman to make the same investigation for tuberculosis in cattle, for glanders and farcy in horses, for anthrax fever—in fact for all the contagious diseases which exist more or less all over our continent.

And then, when there will remain no more doubt of the vast existence of pleuro-pneumonia in our midst, and also of the constant threat of its possible spreading amongst cattle of the plains; when it will be shown how much tuberculosis prevails amongst our milking cows, and by its presence endangers the lives of our people; when it is proved that glanders and farcy are to be found daily in our stables and in the streets of our large cities, can Congress ignore any longer the dangers, and refuse the means for the establishment of the proper measures to get rid of these terrible scourges, constant sources of heavy losses to our commerce and our general wealth; can the necessity for the establishment of a National Veterinary Bureau be any longer overlooked?

NOTICE.

With the May number, the second of our fourth volume, we have mailed to our subscribers a statement of their indebtedness. As we have already stated, all surplus paid to us by subscribers being intended to be used for improvements in our publication, our friends will see the necessity of an early settlement of their

little account by sending us *Post Office order on Station G.* Gentlemen who are in arrears for three years' dues, will not receive the REVIEW after this number, unless their accounts are paid up.

TRANSLATIONS FROM FOREIGN PAPERS.

GOURME; OR, HORSE VARIOLA.

NATURAL AND IRREGULAR FORMS OF THIS DISEASE—INOCULATION AS
A PROPHYLACTIC MEANS OF ITS COMPLICATIONS.

BY M. L. TRASBOT.*

(Continued from page 27, Vol. IV.)

CONCLUDED.

A horse that has had gourme, has obtained a greater commercial value; such is for a long time one of the most commonly admitted ideas. Every veterinarian, consulted at time of purchase, has had opportunities to find this out. There is no opinion more fully believed; and thus the first thought of those who buy a horse, is to inquire if he has had gourme.

A popular fancy, strong as it may be, may often however, it will be granted, rest only on a simple superstition or a purely accidental circumstance. When on the contrary, it touches a material interest, there is a strong tendency to a different conclusion, and the prevailing view of the case will be more likely to rest on the solid facts of observation. And in this case, general reason finishes by showing the truth. The belief above referred to proves it. Notwithstanding the different affirmations, often repeated, even by men of a positive authority, it has never been shaken. To-day, its correctness can no longer be contested.

* Translated by A. Liantard, M.D., V.S.

It is the expression of a scientific truth, positively obtained by observation, and better still by direct experiment.

In general thesis it can be said that gourme affects an animal but once, at least in a severe form.

And again, it is not less admitted that this disease will manifest itself, almost certainly, sooner or later. Leaving aside the technical question relating to the possibility of its spontaneous development in a healthy organism, its appearance by contagion can be considered as an unavoidable fact.

Indeed, as a consequence of the numerous peregrinations to which horses are submitted by transport from breeding to raising districts and thence to great industrial and commercial centres; also by their exhibition in fairs and markets; their gatherings in greater or smaller numbers &c., &c.;—their escape from contamination is almost impossible, one day or another. Therefore, in the practical point of view, one must in principle admit that sooner or later a horse will be affected with gourme, and if a few exceptions are possible, they are so limited that they cannot be taken into consideration.

Again, it is well established, that under the form of horse-pox with a regular evolution, the disease is a mild affection, without immediate danger and without future serious sequelæ.

The solution of the problem concerning this disease, is this: so long as it cannot be avoided, to produce it at one time and even in one selected spot, so as to protect the sick ones from the operation of the influences which usually interfere with its normal progress, and thus give rise to the manifestations more or less serious, already pointed out.

The true means of effectually securing this result is to inoculate according to the directions I am about to indicate.

To do it, one might take the virulent liquid directly from a variolous horse. In raising the epidermic covering of a single pustule at the period of secretion, one may obtain enough material for several inoculations. I have often operated in that way, and always successfully, when of course, I have done it on animals not deprived of receptivity by a preceding attack of the disease. The transmission from horse to horse is consequently

a simple, easy and certain means of developing the disease in its regular form.

Still, it is not, I believe, the best; first, on account of the difficulty which may be often met, of not having at a given time an animal ready to give the material for inoculation, and again, but specially, because the horse may also possess the virus of glanders, whose introduction into a healthy organism would be followed by fatal results: just as physicians have sometimes objected to direct vaccinations from arm to arm, for fear of inoculation of the most serious sequelæ, so the veterinarian must fear the possibility of communicating glanders with horse-pox.

This accident would not be common, it is true, but if it is possible, this is reason enough to guard against it; besides, it is easy to obtain the vaccine matter of a child, which does not present the same danger. I have often used it in my experiments, and it has given me, it is superfluous to say, the same result as the *pure* liquid taken directly from the horse. It ought to have been so, for the vaccine is in reality the equine virus returning in its proper organism. And the certainty that it gives of avoiding the possibility of a glanderous inoculation, renders it preferable in the majority of cases.

Still, one might ask if it is not necessary to know well where the vaccine matter comes from, and if there would not be danger of its being infected with syphilis. Is syphilis inoculable to the horse? Is it the origin of dourine? * This is a question which cannot be answered to-day. Waiting for the solution of this problem, the doubt in which we are left should deter us from accepting, before transmitting it to the horse, any virus whose purity is in any degree doubtful.

For a certain number of experiments that I made, I have used the vaccine deposited at the Academy of Medicine, by the Commission of Vaccinations, and whose guaranteed quality gave me a perfect security. For others, I obtained it from cows and calves to which I first gave it. This last is a mean which can be used if there is any doubt as to the quality of the virus. This, in passing

* French name for *Maladie du Coït*.

through the bovine organism, would free itself of all dangerous mixture, as neither syphilis or glanders have as yet been communicated to animals of that species. One may thus avoid all possibility of danger ; it is an easy thing, as cows or calves which are good subjects for the cultivation of the virus, can always be readily found.

The liquid obtained, where is it best to apply it ?

We have seen in preceding papers that in the horse the variolous eruption is often confluent near the point of entrance of the virus. And we also know that if the pustules are irritated by rubbing or by the contact of irritating fluids, they become inflamed, suppurate, ulcerate, and are accompanied with suppurating lymphangitis, sometimes serious.

Consequently, to avoid these complications, one must look for a region where the action of these irritating causes is to be feared as little as possible. The extremity of the head and the legs, for these reasons, do not answer. After many trials it has seemed to me that the lateral faces of the neck answered the purpose well. On account of its somewhat shallow form and of its situation, rubbing is difficult and even impossible if protected by cradle. And if the confluence of the pustules takes place, no serious condition can follow. I shall therefore until better informed, use that region.

One will make three or four punctions on each side, about five or ten centimeters apart, and placed in line a little above and parallel to the superior border of the mastoido-humeralis. In proceeding thus, I have not seen excessive inflammation nor ulceration of the pustules follow. I do not say that they will never take place, but if they should, the complication likely to follow would never prove fatal.

Besides the question of the place where the inoculations ought to be performed, that of the proper age and most advantageous condition of weather ought to be considered. As far as this goes, there is no need to take into consideration the idea, so often repeated, that gourme could not develop itself properly as a critical disease in very young animals. We know now what weight should attach to this opinion. From the first months following

birth the disease may develop itself and run its course regularly or not, and in both cases protect the animal thus affected for a later period.

Still, perhaps we should not, without hesitation inoculate very young subjects, on account of their lesser power of resistance to the disease. This question, I take the opportunity to say, cannot be actually or positively decided, and will not be unless further comparative experiments are made. It may be possible that, with the object of preventing all accidental contamination, the effects of which are ordinarily most dangerous, sucking animals will be inoculated. However, from the facts, very few, it is true, positive as they are, which I have collected, I am assured that at the end of the first year animals can safely be operated upon. At that period the loss of time for work does not need to be considered; a rather important question in an economical point of view.

As always during the course of the disease, it is prudent to keep the animals at rest and in good hygienic condition, so as to protect them from exposure to cold or other influences likely to interfere with the pustular eruption, and give rise to the appearance of respiratory inflammations more or less serious. There may be, after all, great advantage in inoculating colts before they are broken for work.

As to the time of the year, this seems to me to be of little interest. It is only when one operates upon animals living constantly out of doors that good weather is to be preferred. This is not the most general case. Horses, especially in our days, are kept more or less in-doors, and it is easy to keep them so during the whole duration of the disease. I am satisfied then, that inoculation can be performed in all seasons of the year. I have often done it without noticing the slightest accident.

In all cases after inoculation performed upon very young animals not working yet, or upon adults, it is good to keep them at rest, to feed them moderately and to protect them from all atmospheric influences until the period of dessication of the pustules. With these precautions, after a slight fever, the pustules make their appearance more or less abundantly on the whole surface of the body, from the fourth to the sixth day after the operation, and

almost immediately after the signs of general health show themselves, signs which do not disappear if nothing comes to interfere with the course of the disease, until this has reached its complete resolution.

I most advise veterinarians practising in raising districts, and all in fact, to practice that inoculation as a prophylactic mean of the complication of gourme, satisfied as I am, that by it many losses will be avoided. As to the treatment, I have nothing to say. It would require more than I intend for the present to give. Besides, the indications do not vary much, whether angina, bronchitis or pneumonia are of gourmy nature or not.

I will, however, call your attention to one point of internal therapeutics, in the treatment of bronchitis and pneumonia.

Ordinarily this treatment has for its fundamental basis preparations of antimony—tartar-emetic in doses of five or ten grammes, or kermes in doses of twenty per day are usually prescribed. This practice is sanctioned by years of experience. But can nothing better be done? Some gathered observations have allowed me to decide in the affirmative.

I have in the preceding pages shown that chronic roaring is a common sequel of bronchitis, and possibly also of pneumonia.

My theory of its mechanism of production has suggested to me the propriety of adding to the accepted modes of treatment of these diseases, the internal administration of iodide of potassa, in rather large doses.

In 1874, M. Zundel had already broached the idea that chronic roaring might be due to the pressure upon the inferior left laryngeal nerve, by the lymphatic glands, enlarged at the *entrance of the thorax*, and then recommended arsenical and iodurated preparations.

As I was about publishing this paper, I received from him a letter stating that he had by this treatment obtained excellent results.

I have myself, during several years, often given iodide of potassa, not as a curative, but only as a prophylactic agent.

At first I gave it with the kermes or tartar-emetic for acute bronchitis; I now give it alone, with no less success. Experience

has shown me that to diminish the strength of the disease, to facilitate the discharge, and to shorten the duration of the attack, this drug is better and more powerful than any other I used.

What renders it more valuable, is the fact that it seems to prevent roaring. I have now more than ten observations gathered from cases of very acute bronchitis, at the clinic of the school at Alfort, or from outside practice, which in all probability, in respect to some of them at least, would have been followed by this complication, and which have rapidly recovered, without leaving any marks of their existence, by the treatment with iodide of potassa, and with simple fumigations.

I know this number is too small to be positive. I myself, do not consider it as sufficient. But, still, all things taken into consideration, it is not without a certain value. And for this reason I wish to recommend it. According to the size of the animals I give from eight to twelve grammes of the iodide of potassa for four or five days, then diminish it. I add to this simple fumigations. Nothing more. Of course I do not wish to throw aside the old established treatment.

As to the effect of this drug in pneumonia, I have not yet had sufficient experience to speak knowingly.

As to the mode of action in bronchitis, it is a subject which I propose to treat at a future time.

CORRESPONDENCE.

To the Editor of the American Veterinary Review.

Sir: I desire to bring before your notice certain facts in regard to the position of Veterinary Surgeon in the United States army, as I find them.

In 1863, by virtue of act of Congress, promulgated in General Orders No. 73, 1863, the position of veterinary surgeon in the U. S. army was created, allowing one veterinary surgeon at \$75 per month to each regiment of cavalry, then six regiments. In 1866 four new regiments were added to the established number, by act

of Congress, published in G. O. 56 and 66, but for each of those four new regiments, two veterinary surgeons were allowed, one at \$100 per month, and one assistant at \$75 per month.

When Congress passed that act, it must certainly have occurred to them that one veterinary surgeon for each regiment was insufficient, otherwise where was the necessity of allowing two for each of the new regiments? Do not the horses require as much attention, and are they not equally as many, and as much scattered amongst the different posts, as those of the new regiments?

It is over 13 years that this unequal assignment has existed, and yet no alteration has ever been made. It may have been overlooked, with many more small details in the economy of the army, but taking into consideration that the item for the purchase of horses, etc., for the army is a considerable one in the appropriation bill, and that a great saving could be made by the right treatment of diseased horses by skilful surgeons, it is my opinion that two veterinary surgeons in a regiment, or even one at every post where there are a considerable number of public animals, say four companies of cavalry, or the same number of other public animals, could, by skilful treatment and economical use of medicines (now wasted in the different companies of the regiment), save sufficient to reimburse the Government for the expenses incurred in this employment.

In regard to the position itself, I desire to remark that G. O. 73, 1863, allowing veterinary surgeons for the regiments, says, "one veterinary surgeon to rank as Sergeant Major." In the table showing the organization of the army of the U. S., (Army Register, 1878,) I find, being recognized as civilians, these veterinary surgeons are excluded from the organization table. If belonging to the regiment as part of the regimental organization, and ranking as Sergeant Major, why is the usual rations and clothing allowance withheld from us? If civilians, why are we not hired and paid by the month in the Quartermaster's Department, as all other civilian employees, or put on the same footing as contract doctors?

It is clear to me, as it must be to any one reading this article, that an irregularity exists, which, if cleared up, would induce

many young graduates of the profession to offer their services to the U. S. army. G. O. No. 36, 1879, states that all candidates for the position must be graduates of a veterinary college; this includes that he must have passed a strict matriculation examination, and attended college not less than three terms. They must be above the average in the profession, as the same orders compels them to give lectures on anatomy and pathology, and to instruct the farriers, the blacksmiths, etc. To do this he must be a theoretical and practical veterinary surgeon in the full sense of the word. Why then should the veterinary surgeon not have a certain standing in the army? I think the profession is worthy of holding a commission, as they do in all European armies.

VETERINARY SURGEON.

SOCIETY MEETINGS.

MONTREAL VETERINARY MEDICAL ASSOCIATION.

The regular fortnightly meeting of the Montreal Veterinary Medical Association was held on Thursday evening last, the Vice-President, C. J. Alloway, V. S., in the chair. Mr. Donald Campbell regretted that, owing to ill health, he had been unable to prepare his promised paper, but hoped to do so at some future meeting. Mr. M. S. Brown then described a very interesting and unusual monstrosity of a calf he had recently examined. Mr. E. J. Carter was next called upon to read his paper on rabies, which proved very interesting and instructive. He first glanced at the history of rabies, showing that it has been known from the earliest times; next, the distribution of it occupied his attention. It occurs in nearly all parts of the world, being particularly prevalent in Western Europe. Recently it had almost exterminated the Esquimaux dogs of Greenland. Australia, New Zealand and Tasmania are among the few fortunate locations where it is unknown. Its nature and the cause which produces it were then fully discussed. Its nature is not fully understood, but that it is a disease of the nervous system there is little doubt. Many

causes have been assigned to it, such as hot weather, change of climate from a cold to a hot, etc.; but statistics prove that it occurs oftener in the winter than summer, and that native dogs are as liable to it as those imported. The symptoms of the disease were graphically described, and the speaker impressed upon his hearers the necessity of being able to distinguish between it and an attack of epilepsy. Many dogs, especially pet dogs fed upon meat, were subject to epileptic fits, and sometimes excited in the minds of their owners the fear that they were mad. He had no doubt many valuable dogs had been destroyed from such a mistake. It was commonly supposed that mad dogs were afraid of water. Such is not the case. Mad dogs are often very thirsty, and will attempt to drink, but owing to paralysis of the muscles of the throat are unable to swallow. Cases are also on record of mad dogs swimming across streams in order to attack men or animals on the other side. Fear of water is sometimes, but not always, a symptom of the disease in man, and the name *hydrophobia* should, therefore, be discarded as a misnomer.

A lively discussion followed, and the chairman gave an account of some interesting cases which had come under his notice, not of rabies, which he had never seen, but of the effects produced on the minds of nervous persons when bitten by a dog they supposed to be mad. The disease, he was happy to say, was almost entirely unknown in Montreal and Canada generally, although cases of simple epilepsy sometimes gave rise to sensational rumors.

A vote of thanks to the essayists was passed, and the meeting adjourned. (*From the Montreal Gazette.*)

COMMENCEMENTS.

ONTARIO VETERINARY COLLEGE, TORONTO, CANADA.

The closing exercises at this institution took place on Thursday and Friday in the large museum of the college. A large number of students presented themselves for examination. The large proportion of successful candidates speaks well for the thoroughness and efficiency of the instruction given. The Board of Exam-

iners was composed of the following gentlemen :—Messrs. Coleman, Caesar, Duncan, Wilson, Sweetapple, Elliot, Cowan, McNaught and Dr. Thorburn, who, after a most rigid examination, awarded diplomas to the following gentleman :—

DIPLOMAS.

S. Brenton, Belleville ; A. Bell, Sharpton ; W. Burt, Simcoe ; J. Burnett, London ; G. Dunphy, Salford ; G. Coulter, Islington ; P. Z. Colsson, Mobile, Alabama, U. S. ; J. B. Fretz, Pennsylvania, U. S. ; F. L. Groff, Ohio, U. S. ; H. G. Hawley, Brantford ; Thos. Meredith, Jamestown, N. Y. ; J. Loughman, Montreal ; B. B. Page, Illinois, U. S. ; P. Stevenson, Aurora ; R. Riddle, Cobourg ; D. H. McFadden, Allanford ; U. Springer, Waterloo ; C. P. Smith, St. Marys ; J. Taylor, St. Catherines ; J. P. Whitehead, Delaware ; B. Way, Belleville ; L. A. Severcool, Ohio, U. S. ; P. Shaloli, Ohio, U. S. ; E. P. Westell, Arkona ; D. Young, London.

Primary—G. Bell, Westbrook ; G. Howell, Carlow ; J. Donnelly, Palmerston.

PRIZE AND HONOR LIST.

SENIORS.—*Pathology*—Silver Medal, G. W. Dunphy. Honors—W. Burt, H. G. Hawley, J. Loughman, B. B. Page, U. Springer, C. P. Smith, P. Stevenson, B. Way, J. Whitehead.

Chemistry—First Prize, C. P. Smith ; second, U. Springer ; third, J. Whitehead. Honors, G. Coulter, B. Way.

Entozoa—First Prize, G. W. Dunphy. Honors, C. P. Smith, U. Springer, J. Taylor, B. Way, J. Whitehead.

Anatomical Preparations—Prize, P. Z. Colsson.

Anatomy—Silver Medal, J. Whitehead. Honors, S. Brenton, W. Burt, P. Z. Colsson, G. Dunphy, J. Loughman, C. P. Smith, U. Springer, P. Stevenson, B. Way.

Physiology—First Prize, C. P. Smith ; second, G. Coulter, G. Dunphy, J. Whitehead. Honors, B. B. Page, R. Riddell, P. Shaloli, E. P. Westell.

Materia Medica—First Prize, C. P. Smith, B. Way, equal. Honors, G. Dunphy, B. B. Page, P. Stevenson, U. Springer, D. Young.

Gold medal for the best general examination—C. P. Smith St. Mary's. Honors, W. Burt, G. Dunphy, B. B. Page, U. Springer, P. Stevenson, B. Way, J. Whitehead.

JUNIORS.—*Physiology*—First Prize, J. A. Dell; second, W. E. Langford.

Pathology—First Prize, J. S. Butter; second, J. A. Dell. Honors, D. L. Devone, S. L. Honiford, — Logan, W. E. Langford, S. Maguire.

Chemistry—First Prize, J. A. Dell. Honors, W. E. Langford, A. Maguire.

Anatomy—Silver Medal, J. A. Dell. Honors, J. S. Butter, A. Logan, A. Maguire, — Shaw.

A numerous company assembled to witness the presentation of the above prizes, which took place in the museum on Friday morning. At the conclusion of the exercises, Prof. Buckland, on behalf the Board of Agriculture, stated that in his department, breeding and management of stock, the following prizes were awarded:—G. W. Dunphy, books to the value of \$20; J. W. Litehead, \$15; B. Way, \$10. He also said that he had the authority of the Commissioner of Agriculture for saying that that gentleman sincerely regretted his unavoidable absence. He expressed his full confidence that, great as had been the success of the college in the past, it would be greater in the future.

MONTREAL VETERINARY COLLEGE.

Yesterday afternoon the prizes and diplomas gained by the students at the Veterinary Medical College were presented. At four o'clock the lecture-hall of the College on Union Avenue was well filled with examiners, students and their friends. Among those present we noticed Hon. Lucius H. Beaubien, M.P.P., Prof. McEachran, Principal Dawson, Messrs. A. W. Ogilvie, D. Morrice, J. M. Browning, Hon. Gaudet, Vice-President Council Agriculture; S. W. Blackwood, John L. Gibb, A. Sommerville, Dr. Osler, Dr. Leclere, Dr. Bell, Dr. Alloway, F. S. Billings and W. Bryden, of Boston, and G. H. Barnatt. The Hon. Mr. Beaubien acted as Chairman. On the meeting being called to order, the Chairman, in brief terms, addressed the students and congrat-

ulated them on the success which they had attained in their studies. He called their attention to the fact that those who passed a successful course in the Montreal Veterinary College and received their diplomas, were looked upon all over the world, and more especially in Canada and the United States, as V. S. who understood and were well grounded in the work of their profession. The College had become so useful that not only private individuals, but he was glad to say the Governments of the country were recognizing the good, faithful and hard work which Dr. McEachran was performing. (Cheers.) He wished the College greater prosperity in the future, and trusted next year the students would be double the number. (Cheers.) He had now much pleasure in presenting the prizes to the several successful competitors. The following are the names of the winners and also the graduation class of 1880 :

THIRD SESSION.

Best General Examination.—1st prize, silver medal, Mr. William McEachran, Montreal ; 2d prize, A. P. Hinkley, Buffalo, N. Y.

Anatomy.—1st prize, Mr. Wm. McEachran, Montreal.

Materia Medica.—1st prize, Mr. Peter Cummins, Quebec.

SECOND SESSION.

General Pathology.—1st prize, Charles H. Ormond, Milwaukee.

Anatomy.—1st prize, Mr. Charles H. Ormond, Milwaukee.

Materia Medica.—1st prize, Mr. Fred. Torrance.

FIRST SESSION.

Anatomy.—1st prize, Mr. Walter Wardel.

Best Practical Examination (medalist excluded).—1st prize, a complete case of instruments, presented by Mr. David Morrice, won by Wm. Jakeman, Boston, Mass.

SENIOR CLASS.

French.—1st prize, Joseph Page, Lotbinere.

GRADUATES.

Wm. McEachran, Montreal ; Wm. I. Akerman, Boston ; N. P. Hinkley, Buffalo ; A. W. Harris, Ottawa ; Mathias S. Brown,

Montreal ; Peter Cummins, Quebec ; Joseph Page, Lotbiniere.

The following gentlemen re-registered during the past session, viz.: M. S. Brown, Montreal, P. Q.; William Jakeman, Boston, Mass., U. S.; William McEachman, Montreal, P. Q.; John S. Thomas, Roxburgh, Mass., U. S.; Joseph M. Skally, Boston, Mass., U. S.; Alex. Glass, Philadelphia, Pa., U. S.; Paul Paquin, St. Andrews, P. Q.; Richard Price, Montreal, P. Q.; Chas. H. Ormond, Milwaukee, U. S.; Hilaire Bisailon, St. Valentine, P. Q.; John Chandler, Coaticook, P. Q.; Wm. M. Dundon, Salem, N. Y., U. S.; Fred. Torrance, Montreal, P. Q.; N. P. Hinkley, Buffalo, N. Y., U. S.; N. A. Trudel, St. Genevieve de Batiscan, P. Q.; P. F. Labelle, Ste. Dorothee, P. Q.; Walter Wardle, Montreal, P. Q.; H. Jolicoeur, Montreal, P. Q.; Alex. W. Harris, Ottawa, Ontario ; Edward J. Carter, Montreal, P. Q.; Peter Cummins, Quebec ; Jno. B. Green, Yellow Springs, Ohio, U. S.; Piere Gadbois, Terrebonne, P. Q.; Benj. D. Pierce, Springfield, Mass., U. S.; T. H. Bergeron, Bord a Plouffe, P. Q.; Donald E. P. Campbell, St. Hilaire, P. Q.; Joseph Page, Lotbiniere, P. Q.; Oliviere Maisoneure, St. Francois de Sales, P. Q.; Henry Quimby, Rochester, N. Y.; Andrew Metcalfe, Hudson, P. Q.; J. B. Caverhill, Montreal, P. Q.; D. A. P. Watt, Montreal, P. Q.

The following passed in the *English Classes* in

Botany.—Prof. J. W. Dawson, LL.D., F.R.S., &c., McGill University, viz.: John Chandler, Walter Wardle, Jno. M. Skally, Alex. Glass and C. R. P. Campbell.

Physiology.—Prof. Wm. Osler, M. D., M.R.C.P., London, McGill University, viz.: E. J. Carter, B. D. Pierce, Jno. B. Green, R. Price and C. H. Ormond.

Chemistry.—Prof. G. P. Girdwood, M. D., McGill University, viz.: B. D. Pierce, E. J. Carter, C. H. Ormond, R. Price and John B. Green.

Materia Medica.—James Bell, M. D., C. M., Lecturer, viz.: Fred. Torrance, E. J. Carter, Jno. B. Green, B. D. Pierce and R. Price.

In the *French Classes* :

Botany.—Prof. A. B. Craig, M. D., Victoria College, viz., Paul Paquin, P. F. Labelle and Piere Gadbois.

Physiology.—Prof. G. O. Beandry, M. D., Victoria College, viz.: Hilaire Bisaillon, N. A. Trudel and T. H. Bergeron.

Chemistry.—Prof. E. D. D'Orsenneus, Victoria College, viz.: Hilaire Bisaillon, N. A. Trudel and T. H. Bergeron.

As each of the prizemen came up for his well-won honors, his fellow students gave vent to their pleasure in loud applause.

Mr. M. F. Billings, of Boston, was called upon by the Chairman to address the students. He said that he felt highly honored at being present, and had to thank his friend, Dr. McEachran, for giving him that pleasure. He confessed that when he started for Montreal to assist at the examinations of the V. C. he was rather sceptical of the results in consequence of his experience in his own country, but he was glad to say that his scepticism had all fled, for such an examination as the students of the Montreal Veterinary College had passed did honor not only to themselves but also to those to whom was intrusted the instruction. (Cheers.) He was glad to find the students were so well up in their studies, and that they understood the main thing in Veterinary Surgery, that was, the nature of diseases. He was pleased, indeed, to find so high a standard aimed at in the College, and trusted those now graduating would do all in their power to uphold the College and profession. (Cheers.) He was so well pleased with everything that had come under his notice that he wished it understood that he would be one of the three to give a prize next year for the best student in General Pathology. (Loud cheers.)

Principal Dawson was now called, and was received with warm applause. He remarked that it gave him great pleasure to attend the examinations of the V. C., although his time was well taken up with the examination at McGill; still, his sympathy for the good work that was being carried on in the V. C. was such that he always managed to spare a little time to be with them. (Cheers.) He was in a measure closely identified with them, for their profession was, in a measure, much in sympathy with science. His sympathy was more with those who studied the anatomy of the lower animals than the human, from the fact that the former were, from the nature of things, unable to say where or what was the place or nature of their disease. The highest

scientific skill, he thought, should be sought after to alleviate the sufferings of the lower animals. Again, in the opening up of our country, no profession, he thought, was going to assist it more both pecuniarily and for the benefit of stock raising, than the profession he was glad to see so many of them had adopted. (Cheers.) He was glad to see also that a higher class of students were coming up every year for the profession. Many of them he knew personally, for they were studying botany in his class at McGill, and he was glad to say that they were among his best pupils. (Cheers.) He then counseled the students graduating to also take up the study of agriculture, which was much needed in this Province, for good agriculture was fundamental to good stock raising. The learned doctor, after passing a high compliment on the stiff examination and the proficiency of the teachers, wished the prizemen and graduating class every success. (Loud cheers.)

Mr. D. Morrice, in a few words, expressed his pleasure at being present and witnessing such progress. He at the same time paid a high compliment to the abilities and careful training which the students received at the hands of Dr. McEachran and his assistants.

Dr. McEachran on raising was cheered to the echo. He said that he embraced the present opportunity to offer his thanks to the gentlemen present for their many kindnesses and the assistance which he had always received from them. It was something he was proud of, that with small beginnings, his arduous labors were bearing good fruit. His students were of a class that could not be surpassed by any V. C. on this continent, both in their training and intercourse with their teachers. (Cheers.) It was consoling for all the hard work during the course to hear such compliments paid his pupils by such gentlemen as Principal Dawson, Messrs. Billings and Morrice. The College was increasing yearly in students. Fifteen years ago a veterinary surgeon here was looked down upon, was called a horse doctor, but now all was changed, and the profession was an honorable one—(cheers), and was rapidly developing all over the land. It was felt in every branch of industry. The speaker then referred to

the large immigration that might be looked for this year from European countries, in consequence of the ravages by contagious disease among the cattle, and he was glad to say that indirectly the Montreal Veterinary College would have something to do in the matter, for Canada was known throughout the world as having the most complete quarantine cattle-regulations, and was comparatively free from all contagious diseases. He (the speaker) again expressed his thanks to the Council of Agriculture and to Principal Dawson for their assistance—(cheers)—also to the Dean and Medical Faculty of McGill—(cheers)—who, on every occasion, gave a willing, helping hand. He also offered his thanks to those gentlemen who had kindly come from a distant country to assist them. Mr. Billings, who had passed his college course at Berlin, Germany, and had been through all the best V. Cs. in Europe, had been of great assistance, and his offer of a prize was thankfully accepted. (Cheers.) The speaker then bade his pupils good-bye, and wished them every prosperity.

Mr. A. W. Ogilvie also addressed the students in a few brief words, reminding them that their profession was one that was bound to exert a great influence on the development of the Northwest territory.

The proceedings came to a close with cheers for the Chairman and Professor.

THE DINNER.

In the evening the annual dinner, which celebrates the closing of the College, came off at the St Lawrence Hall, and was largely attended by the professors, graduates and students, besides friends of the College. Among those present we noticed Mr. J. M. Browning and Dr. Leclaire, respectively ex-president and secretary of the Council of Agriculture, Messrs. E. A. Barnard, editor of the *Journal of Agriculture*, and Richard White, of the *Gazette*, Professor Billings, Boston, and Professors Ross, Girdwood, Osler and Roddick, of McGill University. Principal McEachran graced the chair.

After the dinner had been disposed of, Principal McEachran proposed the customary toasts—"The Queen" "The Governor-General," and "The President of the United States."

“The Council of Agriculture” was replied to by Mr. J. M. Browning, in a speech of some length, in which he bore testimony to the high character of the Montreal Veterinary College, the close connection which exists between the veterinary science and successful agriculture, and the desire of the Council to assist, as far as possible, in sustaining the College.

The Chairman proposed the toast of “McGill University,” and in doing so gave that institution the credit of extending to the Veterinary College a measure of assistance without which, with its restricted resources, it would have been impossible to maintain it. The principals and professors of McGill have, by providing lecture rooms and lecturers on special subjects, contributed largely to the success which has attended the efforts to make the Montreal Veterinary College the best institution of the kind in Canada.

Professors Ross, Girdwood and Roddick, suitably responded.

“Examiners and Graduates” was replied to by Professor Billings, of Boston, in a speech which combined the humorous with the instructive. In his remarks to the graduates and students, he said that when they went forth from the College they had only begun to learn the science of veterinary surgery, and unless they made it a life study, profiting by each day’s experience, and by close observation and investigation, they need never hope to attain eminence in the profession which they had chosen. Mr. W. Brydon, of Boston, also spoke to the same toast.

“The Graduating Class” was honored by Mr. Wm. McEachran, one of the graduates.

Dr. McEachran proposed “The Agricultural Interest of Canada,” which Mr. Edward A. Barnard responded to in fitting terms.

“The Under-Graduates,” was proposed by Dr. Leclere, and replied to by Mr. E. J. Carter.

Toasts to “Dr. McEachran,” “Dr. Osler,” and the “Press,” the latter acknowledged by Mr. Richard White, of the *Gazette*, followed in the order named.

The health of “The Ladies” brought one of the most successful dinners ever given under the auspices of the Montreal Veterinary College to a close, and the company broke up at about midnight.

EXTRACTS FROM FOREIGN JOURNALS.

SIMPLE MODE OF SURGICAL TREATMENT FOR PURULENT COLLECTIONS OF THE SINUSES.

M. Friez recommends a modification in the classical operation for cases of purulent collection of the sinuses. Formerly practised by M. Thiebaut, this consists in making a very small opening about two centimetres above the zygomatic crest, and three centimeters from its inferior extremity with a small drill, the bone having been exposed by a crucial incision, and the closing of the hole made, being prevented by the insertion of a small tent of oakum, the sinuses being afterwards washed away with blood-warm water first, and later with glycerine and water in equal quantities, and slightly carbolized. These injections are made two or three times a day. By this treatment Mr. Friez claims: First—A rapid and complete recovery. Second—The possibility of working the animal while under treatment. Third—To avoid large wounds, always unpleasant to the eyes. Fourth—No need to throw the horse down to perform it. Fifth—An easy after treatment.—*Recueil de Medecine Veterinaire*.

INTERMITTENT LAMENESS CAUSED BY EMBOLISM—RECOVERY.

BY MR. TH. VIOLET.

First Case.—A stallion, 9 years old; has worked regularly since he was bought—about one month. One morning he is found lame in the off hind leg; the lameness increases rapidly by work, and he is returned to the stable; one hour afterwards he is entirely well, and moves perfectly well. Returned to work, the lameness reappears. When visited by Mr. Violet, the difficulty was brought on by exercise; the leg dragging on the ground; the extensor muscles of the phalanges seem powerless; the animal rests on the fetlock, and the anterior face of the phalanges and of the foot. The physiognomy of the horse is peculiarly anxious; nostrils largely dilated; the respiration accelerated; the body

covered with abundant perspiration. Returned to his stable with difficulty, the animal throws himself down and remains in that position for half an hour, when he gets up and goes to eating, apparently entirely relieved. Examined then, nothing special can be detected; rectal examination reveals a normal condition of the large arterial trunks. A diagnosis of embolism of the anterior tibial was made on account of the absence of other lesions on the whole extent of the leg; the peculiar characters of the lameness, especially its intermittence, and the condition of the extensors of the phalanges.

The treatment consisted in bleeding at both saphena veins; a long seton at the gluteal region, and a strong liniment over the anterior tibial region, to be removed when severe counter irritation is obtained. Internally 100 grammes of sulphate of soda every day. Walking exercise of five minutes, increased every day by the same length of time. Two months later the animal returned to his work and has done well since.

Second Case.—An Anglo-norman mare is taken lame whenever she goes to work; her perspiration was then abundant, her respiration accelerated; her actions irregular, for want of proper action of the near anterior leg. In this the flexion of the inferior joints, especially of the knee, is deficient, the foot drags on the ground, the rest is made on the plantar surface of the foot and is not painful. Minute examination of the leg reveals nothing wrong. Diagnosis embolism of the cnbital or posterior radial artery. The treatment consisted in slow exercise, stimulating frictions on the forearm, and was followed two or three months after, by a radical recovery.—*Journal of Zootechnie.*

EXTIRPATION OF THE CORD OF THE CERVICAL LIGAMENT IN THE HORSE.

BY MR. BRUN.

A handsome percheron had an extensive diseased condition of the neck at the ligamentum nuchae towards its upper third, which had been treated by injections of Villate solution, free

incision, drainage by setons, etc., all without satisfactory results. The case was growing worse; the swelling had increased; fistulous tracts formed; counter openings and continued irrigations gave but temporary relief. The necrosed cord was always felt as a hard, rough surface, rebellious to every cicatricial work.

The excision of that part of the cervical ligament and of that anterior to it as far as the occipital bone, was recommended as radical cure. All the mane being trimmed off, an incision was made on the median line, from a little behind the diseased part of the cord to the occipital; the cord of the ligament was then entirely cut away, and all diseased yellow elastic tissue removed; the wound was dressed with perchloride of iron, supported by a dressing with heavy quill sutures. The process of repair was established in a few weeks, except near the occipital bone, where a short stump of the cord had remained, and which had to be excised afterwards. No bad results followed, no great deformity—the animal being sold some months afterward for fourteen hundred francs.—*Archives Veterinaires*.

CASE OF DEATH AND RETENTION OF A FŒTUS—SUDDEN DEATH OF THE COW.

BY E. S. HEWENS, M.R.C.V.S.

A cow, about four months in calf, had been exposed to a terrible thunder storm. The next day she was found feverish, with no appetite, the bowels constipated, the milk reduced in quantity, with a slight discharge from the vagina, but no parturient pains. A mild aperient, a febrifuge draught was given, and she seemed to rapidly recover. Some three weeks later she presented the same condition, less the manifestations of the genital organs. She received the same treatment again, improved, and began to have a stinking discharge from the vagina.

Attempts having been made to introduce the hands per vaginum to remove the foetus, without success, antiseptic injections were ordered.

A generous diet was ordered; vegetable tonics with antiseptic given. The appetite improved, but she gradually wasted and dropped dead about three months afterwards.

At post mortem, lungs, heart, intestines and kidneys were found healthy; the liver twice its natural size, and filled with hundreds of small abscesses. The uterus contained a mass the size of a man's fist, the remains of the skeleton of the foetus. The coats of the uterus thickened.—*Veterinarian*.

NATURE OF A TUMOR OF THE SPLEEN IN THE DOG.

BY JOHN W. STEEL, M.R.C.V.S.

A bull terrier bitch, advanced in age, supposed to be pregnant, with an abdomen inconveniently large, quite fat, and had never been sick, presented on examination of the abdominal walls, a large tumor, which was diagnosed to be of ovarian nature. When taken up, the tumor proved to be five inches long by four wide, and three thick—it weighed over one pound and three-quarters; it was somewhat ovoid, apparently cystic, and multilocular, having part of the great omentum appended to it, and a considerable portion of spleen directly continuous with its substance. On section, it was found to consist of straw-colored deposits in the parts nearest to the spleen substance, but on the farthest side, of recent accumulation of coagulated blood. The tumor evidently consists essentially of a number of blood clots, descending the natural venous sinuses, and intralocular spaces of the spleen. The straw-colored parts seem as if the result of extravasation some short time before, but the red parts are evidently quite recent, and serve to illustrate the true nature of the mass. This seems to account for the fact that the appended portion of the spleen is quite healthy, which also proves the absence of lymphadenomatous or tuberculous condition.—*Veterinarian*.

PLEURO-PNEUMONIA.

EXTRACTS FROM THE REPORT OF DR. C. P. LYMAN TO THE
COMMISSIONER OF AGRICULTURE.

THE DISEASE IN CONNECTICUT.

In the course of my investigations in Connecticut the following facts were gleaned :—An outbreak of contagious pleuro-pneumonia, says Mr. E. H. Hyde, chairman of the Commission, had occurred at Greenwich, occasioned by exposure to a calf which had been brought from New York and placed in the herd of Mr. B. Livingston Mead. This farm is located on the State line, a part being in the State of New York and a part in Connecticut. This herd consisted of twenty head. The buildings are in Connecticut. From seven to nine animals have died, the last one about the 18th of March, 1879. The remainder are unaccounted for. These animals were at one time examined by Professor Law.

The herd of Daniel M. Griffin, on an adjoining farm, contracted the disease from Mr. Mead's herd. He had twenty-seven head, eight of which died. With the exception of one animal, Mr. Griffin sold the remainder of the herd to dealers in New York for slaughter. The one he retained remained with his tenant and will soon be slaughtered on the place.

Joseph B. Husted, of Greenwich, took some cattle to New York for slaughter, among them two cows. They were all landed at the infected Sixtieth street yard. The cows were not sold, and, after some hesitation on the part of the New York Commission, they were allowed to be returned to Connecticut, the Commissioners of the last named State being notified of the fact. The State authorities at once ordered them quarantined, but before the letter reached Mr. Husted he had sold them, and they are still untraced. They were taken away from Greenwich on or before July 11, 1879.

Mr. Curtis Judson, of Watertown, near Waterbury, keeper of the Gramercy Park Hotel, bought two cows from Mr. Hedge, a dealer in New York, and placed them in an excellent herd of his

own at Watertown. They proved to be affected with contagious pleuro-pneumonia, and soon infected the herd with which they had been placed. The herd was quarantined, by order of the State Commissioners, but the owner on the 8th of March, 1879, broke quarantine and took them to New York. This fact coming to the knowledge of the authorities in time, they were enabled to be in New York on the arrival of the animals, where they were at once killed by order of the New York Commission. Mr. David D. Hawley, of Danbury, had an outbreak of disease in his herd on October 27, 1879. They were visited by Dr. Hopkins of New York, who made an autopsy of a calf and pronounced the disease tuberculosis. The calf came from New York, and had been with the herd but a month.

Mr. Porter, of Waterbury, had an outbreak among his cattle on the 13th of November, which the attendant veterinarian feared might prove to be contagious pleuro-pneumonia. The herd was visited by the State Board on November 18, and the decision arrived at was that the animals were suffering simply from sporadic disease. No post-mortem examination was made, and they are now reported as doing well.

Some trouble was reported among cattle at Hartland and Milford, but on examination by the Commissioners, the disease was decided to be sporadic. I visited the herd of B. L. Mead, of North Greenwich, which I found suffering from contagious pleuro-pneumonia. Although the trouble was of long standing, some of the cows certainly were in a condition to convey the disease to healthy or non-infected animals. There were ten cows, one pair of oxen, one yearling and six calves in this herd.

The herds of Daniel M. Griffin, Joseph B. Husted, David D. Hawley and Mr. Porter were visited, but no cases of the plague were found. Reports from Watertown, Waterbury, North Bradford, Hartland and Milford were of such an assuring character that I did not deem it necessary to visit those points.

NEW YORK.

I am indebted to the New York Commission for the following statement, made February 12, 1880:—

Putnam County.—On the line of the Harlem Railroad there have been lately slaughtered 176 animals; of these, forty were acute cases. The others, having been exposed to the contagion, were killed to prevent the spread of the disease. The beef was marketed.

In the town of Kent, Joseph R. Sprague has an infected herd of sixty head of cows, steers and calves. They are now in quarantine.

Westchester County.—In Yonkers, Mr. Austin had a herd of twenty-seven head, which had been reduced by the ravages of the disease to eight animals. Mr. Pierpoint had a herd of eleven head which had been exposed to infection; two of these had been killed. Mr. Cheever, on Odell's farm, has a herd of twelve head that have been infected. Mr. Cayl has one animal infected.

In Croton Falls, Bedford Township, Mr. Butler, who generally keeps about fifty animals, has lost by death and slaughter, his entire herd, with one exception.

New York City.—In the city there are believed to be but five infected stables left. These are in quarantine, and are located as follows:—

No. 1.—West Seventieth street, old chronic cases.

No. 2.—West Seventy-eighth street, acute cases.

No. 3.—East Ninetieth street and Madison avenue, acute cases.

No. 4.—120th street and Fourth avenue, acute cases.

No. 5.—121st street and Fourth avenue, acute cases.

LONG ISLAND.

The whole western end of this island, as far back as Jamaica, is more or less infected. The stables of Gaff, Fleischmann & Co., of Blissville, originally the hotbed of the disease, are now perfectly free from all contagion. Jamaica is located some ten and a half miles back, therefore the infected district includes Brooklyn, New Utrecht, Flatbush, Gravesend, Flatlands and New Lots, in Kings county, and Long Island City, Newtown, Jamaica, Flushing and Creedmoor, in Queens county.

Suffolk County.—At the extreme eastern end of the island are extensive unfenced ranges used as common pastures. The plague

prevailed among herds grazing on these ranges, but it is now believed they are thoroughly freed from it, as the last known cases were destroyed at Montank, August 28, 1879, and at Bellport, August 11, 1879. This portion of the island has been subjected to numerous examinations, and is now regarded as entirely free from the plague.

STATEN ISLAND.

A year ago one case of the plague was discovered on this island. The animal was killed. No case has since appeared, and the island is now regarded as absolutely free from the disease.

On the 12th and 13th days of February, in company with one of the New York inspectors, I visited several stables in Brooklyn. I found several chronic cases in the stables, but no acute ones. At Johnson avenue slaughter house I was shown a portion of a characteristically diseased lung, which had been taken from an animal killed a few hours previously.

On February 14 I visited the stables of Mr. Lang, 109th street and 4th avenue, New York, where I found three cows suffering with the plague. One of these was a very acute case, and, I was informed, had been afflicted but three days. This, and one of the others, had been condemned to the offal dock. Mr. Foudre, a neighbor of Mr. Langs, lost a cow on the 12th day of February by the disease. A week before he had bought a cow from a dealer named Louis, and the cow that died was taken sick on the day that this cow came to his stable. The nearest stable to Mr. Foudre's place is on 112th street and Fourth avenue. Mr. Foudre had owned the cow he had for eight months. Lang purchased his sickest cow from a dealer named Franke some five or six weeks previous. She was a "two titter" and on that account Franke knocked off \$5 on her price. She never did well. The other two commenced coughing three or four days before my visit.

On the afternoon of the same day I visited the offal dock and witnessed the autopsy of Lang's cows, alluded to above. Both cases revealed well marked lesions of acute pleuro-pneumonia contagiosa. One of the animals, which showed a temperature of 105 degrees Fahrenheit and thirty-six respirations per minute,

had the whole posterior lobe of the left lung consolidated and strongly adherent to the costal pleura. The right lung was healthy. The pericardium was thickened to half an inch. In both lungs of the second cow were found a number of small isolated spots of the characteristic lesions of the disease, the largest being about the size of a double fist. Their borders were well defined, and the intermediate portions of the lung tissue appeared perfectly healthy to the naked eye. On February 16th, at Twentieth street and Fourth avenue, I found three cows which had been exposed to infection and were in quarantine. They appeared healthy, and one had just been sold to a butcher named McEvoy.

In Fremont, at the stable of Mr. Bohle, I found two cows, one of which had been put into an infected stable on Christmas. Her temperature was 101 degrees, Fahrenheit, and she was breathing at the rate of thirty respirations per minute. The other animal was a Jersey cow. Both animals had been ordered slaughtered as soon as they could be got ready for the butcher. A Mr. Cannons, a neighbor, had had some trouble with his herd, but they were quarantined and seemed to be doing well. The infection to this herd of Mr. Bohle's was communicated by a cow that was pastured with ten others on a common lot. She developed contagious pleuro-pneumonia, and was killed in the month of August. Three months and nineteen days thereafter the second animal was attacked, and sent to the offal dock, where she was slaughtered. At the end of three weeks a third, and at the end of four weeks a fourth animal was taken sick and both were slaughtered. The first one of these animals belonged to Mr. B. Jorkman, the other three to Mr. Bohle, who, as has been before stated, bought a fresh cow on Christmas and put her in with one remaining from his original herd. This was in direct violation of the law and his instructions. She is now diseased and has been ordered to be killed. These ten animals were strictly isolated as soon as the first cow was killed, and no other infection was then possible. Two of them have since been fattened and sent to the butcher in a healthy condition. The remainder, with the exception of those belonging to Mr. Bohle, are still free from disease.

On the 17th day of February, in company with Professor Law and Dr. Hopkins, I visited the farm of Mr. Joseph Sprague, in Kent, Putnam County, whose herd was infected and had been in quarantine for some time. The herd consisted of fifty-three head, and were sold during the day by the State Commission to butchers who had been notified to attend. The animals brought an average of \$6 per head, which was regarded as a low price. Three of the animals were considered too badly diseased for beef, and on being killed showed well marked lesions of the disease in its different stages. The herd was infected by a cow purchased from a dealer named Robinson.

On February 18, in company with the same gentlemen, I visited Croton Falls, Westchester County. We found here a gentleman by the name of Butler, who had lost thirty-one animals out of a herd of thirty-two by the plague. His remaining cow was in quarantine, with no symptoms of the disease manifest. On the 15th of June last, Mr. Butler bought seventeen cows of Mr. Robinson, the dealer above referred to, and they were delivered to him on the 17th of the same month. They had been pastured all the summer on "Hyatt's Lower Farm," with a cow that had been sick but had recovered. The first animal on Butler's farm sickened on September 16, and soon died. The remaining thirty head were either slaughtered for beef or killed diseased.

On February 19, in company with the same gentlemen, I visited the farm of Mr. Daniel Austin, in Yonkers, Westchester County. Originally this gentleman had a herd of twenty-seven head, eighteen of which had either died of the plague or had been killed for beef in the incipient stages of the disease. Five of the animals were killed for beef, and showed no lesions of the disease. Of the four remaining, two are well marked chronic cases—*i. e.*, having portions of encysted lungs. This herd was infected by a cow that had pastured on an infected range called "Hog Hill," in the town of Yonkers. She wandered into a field near Mr. Austin's place, where she died on the 27th or 28th of July, and was not buried for some days after. The disease appeared among Mr. Austin's cattle on October 21. The herd of Mr.

Odell, on whose farm this cow died, was no doubt infected by the same animal. His herd consisted of some valuable Jerseys, among which the plague appeared on August 28. We killed three of his animals, and they all showed well marked lesions of the disease.

On February 20 we visited Mr. Tice, of Newtown, which is a suburb of Brooklyn, L. I. This herd was infected about the middle of October. Eight of his animals died, and he had continued to fill their places with fresh animals. We found twelve of his animals suffering with the plague. Two cows were killed—one an acute and the other an older case—and both showed well marked traces of the disease. His herd was infected by a cow sent him about the 20th of September.

A Mr. Grady, whose stables are in Blissville, a portion of the suburbs of Brooklyn, had lost eleven head of cows out of a herd of fourteen since the middle of September.

PENNSYLVANIA.

I arrived in Philadelphia on February 24, and during the evening visited and had a conversation with Dr. J. W. Gadsden, relative to the prevalence of the plague in Pennsylvania. Dr. Gadsden showed me a private telegram giving him the information that the British Government contemplates raising the embargo on cattle transported from the Western and Southwestern States through Canada, and shipped to Great Britain from ports of the Dominion Government. On the morning of February 25, in company with Dr. Francis Bridge, I visited the farm of Mr. J. F. Taylor, located near the town of Marple, Delaware County, Pa. We found this gentleman's herd suffering with the disease. Having selected and paid for four acute cases, the animals were slaughtered and examined. The post-mortem examination revealed all the lesions of the disease in its acute stage. This herd was infected by a cow purchased by Mr. Taylor in the Philadelphia stock yard. She was in very good condition, and when she arrived on the farm seemed very tired. Next morning she refused to eat and seemed sick. She died a few days thereafter with all the symptoms exhibited by those that have since died of

contagious pleuro-pneumonia.

On February 26 I visited the farm of Mr. Wynne, near Philadelphia. His herd originally consisted of thirty-four head. Ten of these had already been killed and two had died of the disease. An examination of those left developed the fact that the disease was still present in both an acute and chronic form. The owner objected to the slaughter of any of the animals. His herd was infected by some cows he purchased in the Philadelphia stock yards. The disease broke out about the 1st of June last.

On the 27th of February I visited Messrs. Martin Fuller & Co., who have charge of the Philadelphia stock yards. They offered me every facility for an examination of the premises. During my interview with these gentlemen Mr. Fuller said something ought to be done to relieve the dealers in stock from the oppression of the English embargo; that the European trade is now carried on at a positive loss, and that this loss is clearly traceable to the embargo on our live cattle. He further stated that he was in Europe last season and found the market flooded at Liverpool. His stock was detained fifteen days in quarantine before it could be slaughtered. Besides the expense of feeding all this time, his animals were positively shrinking in weight: that when they were finally slaughtered he was compelled to accept any price offered. He found dealers there who said they could afford to give from \$15 to \$20 per head more for the animals if they were allowed to drive them back into the country and slaughter them only as needed. During the day I met by appointment, Secretary Edge, special agent of the Governor. He seemed to appreciate the fact that more thorough and active measures than those heretofore used, are necessary for a complete suppression of the plague. He thinks the better plan would be to pay a good price for all exposed animals, and that in the country all exposed and infected animals should be slaughtered, as well as those acutely diseased. Under existing circumstances he does not think it would be politic for the State of Pennsylvania to thoroughly eradicate the disease; indeed, he does not think this possible so long as the southern border of the State is unprotected from importations from Maryland. Until quarantine measures are established

against this State, or the State itself takes some action for the suppression of the disease within its borders, the State of Pennsylvania cannot hope for success. The farmers of Pennsylvania will go to the Baltimore stock yards to buy "frames" and in this way new cases are continually being brought into the State. Under the present construction of the law sufficient means to pay a fair indemnity cannot be obtained, and to kill even diseased animals without funds to pay for them, the Secretary believes would result disastrously, as it would prejudice the farmers against a better law which is hoped for in the near future. His policy is simply an effort to keep the disease within its present limits, with the destruction of as few animals as possible. Up to January 1, 1880, the Secretary had expended but \$2,700 in repressive measures.

On February 28, while examining some cows at the stock yards, I found an acute case of contagious pleuro-pneumonia. The affected animal was in a yard with some twenty other milch cows, and all were being offered for sale. This animal was seen also by Dr. Bridge. On March 1, while examining lungs of slaughtered animals at the Philadelphia abattoir, I found one showing the well-marked lesions of the plague. The butcher said the animal came from Illinois, but it was afterward traced to Cecil County, Md. On the 2d day of March I visited Camden and learned some facts relative to the extent of the plague in New Jersey. On the 3d inst. I attended a meeting of the farmers and stock raisers in the infected district. The meeting was held in Philadelphia and was called for the purpose of devising means for the extirpation of the plague. During the day visited Elm station, Montgomery County, and assisted in selecting six diseased animals from Mr. Wynne's herd, for the purpose of post-mortem examination. On the 4th and 5th days of March I was engaged in examining lungs of slaughtered animals at the Philadelphia abattoir. I found no traces of the disease, but on the 4th inst., while examining some cows at the stock yards, I found a second case of the plague in an animal that came from near Gettysburg, Adams County, Pa.

The following are the sources of infection and locations of

diseased herds in Pennsylvania:—

Philadelphia County.—The Philadelphia stock yards are infected. These yards are constantly receiving and sending out to different localities diseased and infected animals.

Chester County.—Mr. M. Covning, of Chester Valley, has a herd of twenty-seven head, among which the disease has appeared. The herd was infected by a cow purchased from a drover, and the infection could not be traced.

Mr. J. Dickinson, of Chester Springs, has a herd of twenty-eight head. These animals were infected by the owner, who brought the contagion from a neighboring farm, where he had administered medicine to a diseased animal.

Mr. G. V. Renard, Chester Valley, had a herd of eighteen animals infected by his neighbor's cattle (Mr. Covning's).

Mr. Renard's cattle had infected a herd of fourteen head, owned by Mr. J. W. Wilson, his near neighbor.

Mr. C. Holland Frazer, of the same neighborhood, had a herd of twenty-six head infected by a purchased animal, which he was unable to trace.

Mr. W. Pugh, of Chester Springs, had his herd infected by Mr. Dickinson, alluded to above, who visited this herd for the purpose of administering medicine to a sick animal.

W. J. and H. A. Pallock, Downington, had a herd of thirty head infected by a purchased animal.

Mr. W. Reid, Westchester, herd of five head. Chronic cases; source of infection unknown.

Mrs. Hermann, Westchester, herd of twelve head. Infected from neighboring cattle.

Mr. W. E. Pennypacker, Cambria, herd of fourteen head. Probably infected from neighboring herd.

Holmes & Bunting, Oxford, herd of thirty-five head. Infected by Mr. Turner's cattle on adjoining farm.

Mr. M. Young, Bradford, herd of thirty-six head. Infected by Mr. Turner's cattle.

Between the herds of Holmes & Bunting and Mr. Turner was a large meadow. The bulls broke down the two intervening fences, and the herds mingled in the meadow. The herds were

separated as soon as men on horseback could separate them, but not soon enough to prevent infection.

Montgomery County.—Messrs. J. L. & A. S. Reiff, Worcester, herd of fifteen head. Jacob L. Reiff had bought of five different dealers during May and June, and it was impossible to tell from which one the disease came. Two animals have died and two others have been killed by order of the State Inspector. Five others had been slightly affected, but had recovered. A. S. Reiff purchased a cow of his son in July, about the time of the outbreak. One animal died and a second one was condemned and killed by order of the State Inspector. Five other animals were affected, but all had recovered and had been released from quarantine.

Joseph Tyson, Worcester, herd of thirteen head. Mr. Tyson purchased a cow of a man who had previously purchased her at the Philadelphia Stock Yards. She was killed on September 24, 1879, by order of the State Inspector, but as she had been isolated on the appearance of the first symptoms of the disease, only one other animal was infected.

Charles T. Johnson, Lederachsville. This gentleman's herd was infected by an animal purchased from a dealer. Up to the date of the first inspection in October last, five animals had died. One was afterward condemned and killed. Five out of the remaining ten were affected, but had recovered.

Peter M. Frederick, Lansdale. Herd quarantined January 29, 1880. The infection was communicated by a cow purchased in the Philadelphia stock yards. Two animals had been condemned and killed. The remainder—ten animals—were free from disease on March 4.

Jacob D. Wisler, Worcester, herd quarantined February 6. Three animals had been condemned and killed, and three others were sick.

John C. Blattner, Worcester, herd of sixteen head. The plague had prevailed in this herd in a mild form for the past four months. None of his animals died, and he did not suspect the nature of the disease. His cows were greatly reduced and he had been feeding at a loss. One of his animals had commenced

to lay on fat, and all were free from disease except the altered structure of the lungs, the natural result of the disease. This herd was infected by Mr. A. S. Rieff's cattle, mentioned above.

W. W. Latrobe, Merion, herd of fourteen head.

W. Wynne, Eln Station, herd of twenty-eight head. This gentleman had lost several animals. The infection came from a cow purchased at the West Philadelphia stock yards.

Bucks County.—Aaron Yoder, Dublin. This herd was quarantined September 25. The first to sicken was one that he purchased two weeks previously. As she had passed through the hands of three different parties, it was impossible to trace her back satisfactorily. Three out of the four were affected, but had recovered.

Isaiah Kletzing, Dublin. This herd received its infection from Yoder's cattle before they were quarantined. Three animals had recovered.

Lehigh County.—Charles Krauss, East Greenville. This herd was quarantined December 13. The infection came through a cow purchased at the Baltimore stock yards. Two animals died and eleven were condemned to be killed. Thirty animals remain and are thought to be free from disease.

Cumberland County.—Samuel Hess, Eberly's Mills. Herd quarantined March 20, 1879. Infected by cattle coming from Baltimore stock yards. This herd is in York County.

Delaware County.—R. L. Jones, Upper Darby, herd of forty-nine head. Infected by purchase from Philadelphia stock yards.

Thomas Cunningham, Upper Darby, herd of twenty-one head.

J. G. Haenn, Darby, herd of fourteen head.


J. Lickens, Ridleyville, herd of fifteen head.

J. F. Taylor, Marple, herd of thirty-six head. One third of his animals had died, and the disease was still present.

Lancaster County.—J. F. Turner, near Oxford, Chester County, herd of fifty-two head. Infected by the adjoining herd, into which the disease had been introduced by some calves brought from the State of New York.

David Williams, Colerain. This herd had come in contact with the diseased Oxford herd, and was quarantined before any symptoms of the disease appeared.

Lane Gill, Colerain, herd of five head, adjoining above.

 *Adams County*—J. Redding, Gettysburg, herd of thirteen head. Infected by purchase from Baltimore Stock Yards.

(To be continued.)

NOTES AND NEWS.

PLEURO-PNEUMONIA IN MARYLAND.—At a meeting of the Deer Creek Farmers' Club, of Harford County, the following resolution was adopted:

Whereas, Reports have been published that pleuro-pneumonia exists among the horned cattle in Harford County, therefore be it

Resolved, That although the members of the Deer Creek Farmers' Club have no knowledge of a single case of plenro-pneumonia, or any other infectious or contagious disease, among the cattle in Harford County, yet, considering the importance of this subject to the farming interest in the future, our representatives in the State Legislature and in Congress are hereby requested to nrge such legislation in the respective bodies of which they are members, as may tend to prevent the introduction or the spread of this disease in our State or country.

A committee was appointed to make a thorough enquiry into the matter.—*American Farmer*.

PRIZE.—Mr. I. T. Duncan, V.S., graduate of and Anatomical Demonstrator in the Toronto Veterinary College, has been awarded Hon. I. H. Pope's prize of \$50 for the best essay on contagious pleuro-pneumonia.

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ORIGINAL ARTICLES.

STUDY ON CRIBBING—CAUSES—MEANS OF PREVENTION AND CURE.

BY M. CH. MARTIN.

Cribbing is a *vicious habit* consisting, in the horse, in an *abnormal inspiration of air*, which is always followed by *ingurgitation* and frequently by the *swallowing* of that gaseous fluid.

This vice impairs the functions of digestion and nutrition, often producing colic and emaciation in the affected animal, and by seriously diminishing his power of continued labor, depreciates his value while forming the habit, and renders him wholly worthless when it has become confirmed and established.

The horse cribs *with or without* taking a point of rest, but what characterizes essentially the vice, is the *noise*, or *eructation* produced by the shock of the air against the walls of the pharynx at the time of aspiration.

Cribbing with *ingurgitation*, or when the air does not go beyond the pharynx, is in itself a serious vice, but accompanied by *deglutition* is much more so, because the air, after passing beyond the pharynx, follows the œsophagus, and entering the stomach, penetrates into the intestines. It is this form of cribbing which impairs digestion and nutrition, with consequent debility and emaciation, ending in premature death.

The determining or efficient cause of cribbing is the depression and sudden dilatation of the pharynx, produced by the contraction of the sterno-hyoidæus and sterno-thyroidæus muscles. These muscles do not act, it is true, immediately upon the pharynx, but their fixed point being at the sternum, their contraction lowers the hyoid and the larynx, to which the pharynx is so intimately connected that the hyoid and larynx can not be lowered and brought nearer the sternum without carrying with them in the same motion, the pharynx.

Before going further in the study of cribbing and of its occasional causes, let us examine closely a cribber, and initiate ourselves into the *organic mechanism* of this unnatural act, taking for type the *cribbing with point d'appui* which is most frequent.

II

The horse which *cribs with point d'appui*, seizes the feed-box or hay-rack with its incisives in order to immobilize its head by resting it; most commonly upon the superior incisors. In this position, the lips are wide apart and the mouth open; he then contracts suddenly all the flexor muscles of the neck, the sterno-hyoideus and thyroideus muscles engaging in the same action, and drawing the pharynx inwards. This lowering motion elongates this canal, dilating it lengthwise, and the air that it may contain is thus rarified. It is at this moment that the atmospheric pressure, acting in the open mouth, the outside air raises the velum palati and rushes rapidly into the pharynx, thus producing that *noise* which is nothing more than the effect of the collision of the air upon the pharyngeal walls.

The mouth being wide open, the sudden contraction of the sterno-hyoideus and thyroideus muscles, the lowering of the phar-

ynæ resultiny from it, and the dilatation of this organ, constitute then, all the anatomical mechanism of cribbing.

In examining the cribber, nothing is more evident than the depression of the larynx carrying on the pharynx, and it is very easy to notice that the eructation follows immediately this dilating depression of the pharynx, and that these two phenomena are almost simultaneous; one may say of eructation on account of its relation with the depressions: *post hoc, ergo propter hoc.*

III

To have an exact idea of the effects of cribbing and of its mechanism, I tried myself to crib and I succeeded perfectly. To do it, I sat down, rested my elbows on a table, and, to keep my head steady and immobile and my mouth partly open, I rested my upper teeth on my thumbs. In this attitude I suddenly lowered my pharynx. Immediately I felt air passing through my mouth, raising my soft palate and rushing upon the walls of my pharynx, producing a well-marked noise of eructation. I kept on for several minutes and I *ingurgitated* and *swallowed* air at will.

I then cribbed easily *without appui*, by keeping my head steady, my mouth open and lowering my pharynx suddenly. Then I closed my mouth and kept up the same depression of the pharynx. Air then rushed into my fauces through the nose, and the same eructation was plainly heard. Is it not in that manner that the horse cribs when, with his mouth closed, he rests his chin on the feed box or manger?

What in cribbing is called eructation is then the effect of an aspiration of air and not a regurgitation, a return of gas; it is an eructation in an inverse direction.

IV

When air, by the act of cribbing, is introduced into the pharynx, if it does not go beyond that canal so far as to penetrate the œsophagus, in other words, if it is only *ingurgitated*, it will be thrown back or returned outside by the nasal cavities in the expiration following the eructations; as the horse which is about to

crib takes first an inspiration, respiration is stopped at the moment where the belch is heard, and then the ingurgitated air is forced outward in the subsequent expirations.

If the air is swallowed, it follows the œsophagus, penetrates into the stomach and the intestines, and if the animal keeps on for fifteen minutes or more, meteorism, tympanitis and colics make their appearance.

V.

Some 175 years ago, Solleysel wrote that *cribbing was a habit in which the horse swallows air*: but he had not proved it.

For perhaps half a century, the most erroneous ideas have been published on the nature and the causes of this affection. Several authors have written :

1st. *That cribbing was the noisy expulsion by the mouth of odoriferous gases coming from the stomach and the intestines.*

Refutation. During the many hours when I have watched cribbers, I have never found the herbous odor, given to the returned gases. When the horse ejects gases or liquid matters from the stomach (as is seen in some colics), the vomiting takes place through the nasal passages, not through the mouth ; the soft palate explains this phenomenon by its conformation.

I have seen horses suffering with colics, return gases without being mixed with any other matters ; in these cases the noise made was not *short* and *clear* as in cribbing, but was a weak and long noise, composed of successive sounds ; a kind of borborygmus.

2d. *That cribbing was the result of an old organic lesion of the stomach or of the intestine.*

Refutation. Veterinarians know that to make a horse cease from cribbing it is often only necessary to approach him. We all know that change of place in the stable or change of manger, will often cause the animal stop, if not forever, often for several days.

Would these changes have the effect of curing an organic lesion of the stomach or intestine ? Many horses which by cribbing excessively, had become thin and emaciated, had ceased cribbing when the objects upon which they took their *point d'appui*, were removed, and had then recovered their strength and their

fat condition in a few weeks. . . . Where was the chronic disease of the stomach and of the intestine ?

3d. *That cribbing was the symptom of a stomach or intestinal pneumatose produced by difficult digestion, that it was a mean to get rid of the gases which would otherwise produce meteorism.*

Refutation. The collar, that true carcan, with which the throat of the poor cribber is compressed and by which the act of cribbing is often prevented ; would it be a specific against the stomach or intestinal pneumatose ? That collar, which *prevents so completely eructation*, if it prevented the *expulsion of gases*, would it not become the immediate cause of a fatal tympanitis ? Fortunately it only prevents the ingurgitation of air.

Many horses, who do not crib in eating oats or hay, do it in eating straw only. Is it because the presence of straw in their mouth gives rise to gastric or intestinal pneumatose ? Some animals crib when the straw is *tied up in a bundle*, but not when it is untied and loose. Would the fact of the straw being tied render the digestion difficult, and would untying it cure the trouble ?

The proof of the aspiration of air in the act of cribbing can also be found in the fact that in the animal who swallows it, the tympanitis increases with the length of time during which the habit continues.

Conclusion. *Cribbing is a direct cause of the digestive troubles, of difficult digestion, of the gastric and intestinal pneumatoses and is not an effect of chronic gastritis and enteritis.* And then when the autopsy of a cribber shows its gastric and intestinal mucous membrane modified, this condition must be attributed to the *abnormal irritating and long-continued contact of the air swallowed, with organs which were not made to be exposed to atmospheric impressions.*

Experiments have been made to determine whether in cribbing, there was aspiration of the air or regurgitation of gases. To this purpose, pulverized substances, very light, were placed near the mouth of the cribber and these powders were seen inspired by the mouth at the moment of eructation. This experiment did not satisfy me. I have placed flour on the spot where the animal rested his mouth to crib, and have seen this substance inspired at the time

of eructation, but what remained on the manger was blown afterwards, and with much force, by the expired air.

VI.

Cribbing is a bad habit acquired by horses in the stable, as a consequence: 1st. of the bad disposition of the hay-racks and mangers; 2d. of the insufficiency of the size of the ration; 3d. of idleness and inactivity.

To well understand the mode of action of the first of these causes, let us look how the prehension of solid food is performed by horses.

Colin in his Physiology says: "The horse and the other solipeds use their lips and incisives teeth both to take their food either at the hay-rack or the grass yet attached to the ground, or the oats and the other divided and pulverized substances. Their long, very movable and excessively sensible upper lip serves to gather the grass and slips of hay, and then the incisors take hold of it and pull it from its place."

The eminent professor has omitted to tell us *how*, by *what motion*, this action of pulling is done; I will try to fill up the gap and explain the process.

When the animal is *at grass*, the lips and the incisor teeth are not always sufficient to tear the grass from the ground, as the teeth are not made to cut neatly and at once plants of a fibrous and resisting structure. In the same way *in the stable*, to pull off hay from the rack, or straw from the bundle, the action of the lips and teeth is not always enough.

1st. *At grass*, when the plant is resisting, the action of these organs failing, the animal executes a movement of elevation of the head. It is this motion from below upwards, produced by the levator and extensor muscles of the head, which comes to assist the deficient action of the lips and teeth in the prehension of the blades of grass.

The action is so much more evident and marked when the grass is tougher; it is scarcely visible when the grass is short and tender. It is easily made evident and marked, if a tied bundle of clover, secured to the ground, is offered the animal to eat.

I insist strongly, and with reason, on the movement of traction upwards, as it is a *rational movement*.

2d.—*In the Stable*.—While at grass and in his state of nature, the horse takes his food at the level in height of his feet, or at best up to his knees. In the stable, the food is placed in racks some distance above the level of the floor. In these racks, the food is almost always dry, and offers a resistance in proportion to the manner in which it may be tied up and to the openings between the bars of the rack, which may greatly vary.

To take hold of the food, then, the horse has to perform motions of traction from *above downwards*, by contracting the flexors of the head. These motions of traction downwards become then, the occasional cause of cribbing.

If the movements upward are natural in the prehension of food, those downward are unnatural in the same physiological act.

When a horse begins to crib, it is always by pulling his food from the rack, straw principally, which is the most difficult to take hold of.

Let us now examine a young horse, having a good appetite, hungry, and which has in his rack but a little straw. He takes hold of it, finds some difficulty after seizing it with the lips and teeth in bringing it in his mouth. To complete the prehension of his mouthful, he performs an energetic movement of traction downwards; with this movement all the flexor muscles of the head and neck, including the sterno hyoideus and thyroideus, enter into action; these last muscles depress the pharynx, hence the dilatation of this organ, the rarefaction of the air it contains, the rushing of the external air in the pharynx; the shock, the eructation, in one word, the cribbing, as I have demonstrated before.

VII.

Many young horses which never showed a disposition to crib when in the stable of the farmer who raised them, become cribbers when they are alone in a stable, especially if for some reason the *volume of their ration is reduced*.

It is known that farmers give their young horses pretty nearly all the hay and straw they will eat; this regime increases the

capacity of the stomach and the intestines, and gives the animal a large belly. The person who buys such a horse, to make of him either an elegant saddle horse or handsome coach horse, wants to reduce that unsymmetrical abdomen—and to do it reduces the ration of hay and of straw. At the farmer's the animal had 15 kilograms of hay and as much of straw daily; they are reduced to 5 kilograms—and the horse which at each meal before had 5 kilograms receives now only two kilograms, with which, with the straw and oats, he is to fill up the capacity of his stomach of 15 litres.

All that food taken will scarcely fill two-thirds of his stomach, and he will yet be hungry, as that terrible sensation ceases only, according to Mr. Colin, when the *stomach has received all it can contain*. This horse, whose stomach is incompletely full, who is hungry, and has nothing left in his manger or his rack, will begin to bite them, gnawing them; by powerful contractions of the flexor muscles of the neck and head he will try to tear and pull them to pieces; and in these contractions the pharynx will be depressed and the cribbing produced, as I have already demonstrated.

It is thus that healthy and strong horses, and big eaters, have become cribbers and formed the habit from no other cause than the insufficiency of the volume of their rations.

Nervous and well bred horses become cribbers by idleness: it seems that it is by tediousness, by impatience of the inactivity to which they are subjected, that they bite and gnaw the mangers, racks, stalls, ropes of the halters, etc.,; and it is always in making energetic tractions upon these objects, in contracting the flexor muscles of the head, that they depress the pharynx and succeed in cribbing.

VIII.

The horse which is a confirmed cribber, does not crib while at grass or when his food is placed in front of him on the ground. If he wished to do so he could not, for two reasons, 1st, because in that attitude the sterno hyoideus and thyroideus muscles are so relaxed that their maximum of contraction could not depress the

pharynx ; 2d, because, in this case, the cribber, to perform the act of prehension, is forced to move his head from *below upwards*, and that cribbing is only possible in movements of the head from *above downwards*.

A cribber with point d'appui, either in eating or after his meal, must have a place to take this d'appui at a certain height. From the experiments I have made it is proved that a horse of ordinary size, say 1 meter 53 centimeters, cannot crib, if the object upon which it can take his point d'appui, is placed at 50 centimetres from the ground—above this, ingurgitation is not possible.

Most mangers are placed at 1 meter 20 centimetres ; hay racks are put at least 1 meter 50 centimetres from the floor. This bad disposition excites the act of cribbing, as at that height, the head raised to that point, all the necessary conditions for cribbing exist—as in this position the prehension of food can take place only from downward motions.

Evidently, in such conditions, cribbing must develop itself sooner or later.

The *natural prehension* taking place only by movements of the head upwards, we may say that cribbing is the result of an *abnormal prehension*, in which the horse is obliged to make movements of the head downwards.

IX.

From the preceding experiments and observations it results : 1st, That the horse which cribs cannot do it if his food is placed in such situation that to take it he is obliged to move his head *upwards*, and if he has no place to take a point d'appui below 50 centimetres from the ground. 2nd, That it is in taking hold of his food in high placed racks, in executing movements from above downwards to secure it, that he becomes a cribber.

This being admitted, the true treatment, both preventive and curative, of this affection, is to have hay-racks and mangers placed at a distance from the ground not exceeding 50 centimetres.

To be Continued.

THROMBOSIS (CONTAINING PARASITES) OF THE GREAT MESENTERIC ARTERY.

From the introductory remarks of the highly interesting cases reported in the first article of the fourth volume of our professional organ, I infer that citations belonging to the sphere of the same category would not be objectionable. Therefore I take the liberty to communicate one of my earliest observations of an analogous nature.

The memorandum is dated September 30, 1857. I had no idea then of making any further use of it than to compare it at some future time with similar occurrences, for which I have been looking ever since in vain.

The subject was a nine-year-old brown mare, sixteen hands high, and in tolerably good condition. I was informed that during the five months the man owned the mare, she never refused her food until the morning she took sick, and the only strange symptom he ever noticed was that about a week previous, while hauling stone, she for a few minutes dragged her hind limbs in such a manner as though some spinal disease was in progress.

September 30—Find the animal in the stable lying on her chest, unwilling to rise, coat staring, temperature diminished over the whole body, Schneiderian membrane congested, pulse 70; heart-strokes can be felt on both sides of the chest, respiration heavier, but not accelerated; peristaltic action of the bowels sluggish, feces soft, defecation frequent, but in small quantities.

October 1—7 A. M., condition unchanged; in the evening apparently recovered. During the night the patient discharged considerable soft, undigested feces.

October 2—In the morning, when the owner appeared, the mare neighed lustily; water then was given her, which she drank freely. After eating about one-third of her food, she commenced looking back to her sides, lying down and rolling about; this uneasy spell passed off in a short time, and at noon she ate some food with apparent relish. At 4 P. M. the pains reappeared, attended with profuse perspiration; the dorsal position is now the preferred one. At 8 P. M. she began sitting on her

haunches. The borborygmus was inaudible sometimes for hours, then again would set in with encouraging alacrity, though only temporarily. The voiding of feces and urine ceased at 1 P.M. She is but slightly tympanitic. The peripoheric temperature and sensibility sunk in a hopeless manner.

October 3—This morning the mare is reported better; an examination however, indicates the reverse. I advised the owner to take her to the woods, wherefrom he returned in a short time with the information that she died soon after reaching the place. During the animal's illness, she, at intervals, showed lameness of the left fore-leg.

Autopsy made two hours after death. The cadaver was slightly tympanitic, stomach healthy, small intestines appeared anæmic; the cœcum and colon somewhat engorged, contents of the whole alimentary tract of a semi-fluid consistence, the remainder of the abdominal organs apparently healthy. Not satisfied with the result, I continued my researches, and found the great mesenteric artery obliterated by coagulum, consisting of a fibrinous mass about two inches in diameter, and more than twice as long, containing in the centre two worms, of the thickness of a common sewing needle. One of them was a little longer and alive, with red head and tail, and the rest of the body almost translucent. This species of parasites is termed by Prof. Bollinger *sclerostomum equinum*. In my opinion it is the same entozoone described by Prof. Zurn as the larva of *strongylus armatus*.

Considering myself amply rewarded, I neglected to look for elongations or branches of this thrombus, which might have furnished a clue to an explanation as to the cause for the periodic lameness in the left fore-leg, with which she was affected during her illness. "Was it the result of the obliteration of said vessel?" If so, "how is suspension of circulation in the great mesenteric artery liable to impede locomotion in the anterior extremities?"

The dragging of the hind limbs which she exhibited for a few minutes, as mentioned above, goes to show that the embolism had a more extensive range than I detected.

Cincinnati, O.

J. C. MEYER, SR., V. S.

EDITORIAL.

VETERINARY SCIENCE IN AMERICA.

In 1876, on the occasion of the festivities of the Centennial, the United States Veterinary Medical Association held its anniversary meeting in Philadelphia.

A number of papers were presented and read at the meeting, amongst which we had prepared one upon the history and progress of Veterinary Medicine in the United States.

This paper was found by Prof. Steele, F.R.C.V.S. &c., of sufficient interest, and, we dare say, of truth, to induce him to use it in the writing of an excellent article which was published in the *Veterinarian* in January of this year.

In the May number of the same journal appears a letter from Mr. R. Jennings, Jr. on the same topic, which we present to our readers, and in which we are said to have been "unjust, unfair and prejudiced," and that we have committed "errors and omissions" when we allowed this paper to be published.

Had the gentleman read our article he would have seen that we stated that "many points would be found deficient," and also "that to write such a history a much older resident of America would have been better qualified for the task"—a sufficient apology, we thought, for what did appear in our review of the subject. But the gentleman did not read it! We hope he will, however, and satisfy himself of the impropriety of the adjectives he so freely applies to us.

Mr. R. Jennings, Jr., says that before the time we came to the United States, the "rough road traveled by his (our) predecessors was made comparatively smooth, leaving him (ourselves) an easy victory."

To this we would answer that we have been nearly twenty years engaged in our special work, and that what little success we have attained we hesitate to call a victory; we are yet to learn who else attempted it before, and struggled through it without giving it up after the weakest attempt.

We are taken to task in reference to two points—the first is the establishment of veterinary colleges in the United States, the second in relation to the organization of the United States Veterinary Medical Association; both of which he wishes us to attribute to his father.

In our history, we gave credit to the organization of the "*Pennsylvania College of Veterinary Surgeons*" as having taken place in 1866, and not a word is said by us of the connection of Mr. McClure with that institution. It is true, Mr. Jennings tells us of the organization of the "*Veterinary College of Philadelphia*" in 1850. We were ignorant of this fact. But the reader will, by careful perusal, satisfy himself of the *hard smoothing work* done by that institution, which, chartered in 1850, took three years to organize, which organization failed by the resignation of two of its members; which was, however, reorganized in 1857 to see a second failure by a second resignation amongst its faculty; and the college remains, as we stated in our paper, without a building, and delivering lectures (if any are given) in the rooms of the Agricultural Society. We must, however, acknowledge our error in mentioning the name of the institution. How long did the father of the *Veterinary College of Philadelphia* constitute the entire faculty, after the resignation of Mr. Bowler in 1859-60, before he went out *traveling*, we cannot answer. We were again going to be unjust, for Mr. Rob. McClure was then appointed to fill the vacancy left by Mr. Bowler, *which connects him with the Philadelphia Veterinary College*.

In relation to the true Pennsylvania College of Veterinary Surgeons, now dead since 1870, we may have made some errors. We would be thankful to our friend Dr. Gadsden, who has been in Philadelphia for a number of years, if he would acquaint us with the running of that institution during its existence of four years.

Can the Veterinary College of Philadelphia, considering the manner in which it performed its work and not merely because it obtained its charter in 1850, be considered as the first one in the United States?

We say no! The first truly organized school with faculty, building, lecture-rooms, clinical department, hospital, dissecting-

room, was the New York College of Veterinary Surgeons; a fact which we stated in our paper, read before the United States Veterinary Medical Association.

At the said meeting many members from different parts of the country were present, and not one made any objection or found any misstatement when the paper was read and ordered to be printed; *not one to find it unjust, unfair or prejudicial!*

As to the second grievance brought to our door, the organization of the United States Veterinary Medical Association: Is Mr. Jennings, Sr., the father of it? Many of the members present at the first meeting of the organization are yet alive, and they can correct us if we are in error.

In our paper we gave credit to the Philadelphians for taking the initiative in the movement. By the letters which Mr. Jennings, Jr., publishes, we are shown that his father and Mr. Wisdom "were requested to correspond with members of the profession" on that point. Mr. Wisdom was an elderly gentleman, who, we doubt not, was very glad to give his colleague all the duties of the secretaryship, and for that reason all the letters which are printed in the *Veterinarian* are directed to the same person.

We believe that the minutes of the meetings of the United States Veterinary Medical Association will show who were the true starters of that organization, and we believe that the credit belongs just as well to any of the veterinarians of Pennsylvania, New Jersey and Delaware as it belongs to one man alone, as the article of Mr. Jennings, Jr., seems to intimate.

Our connecting Mr. Jennings' and McClure's names in relation to veterinary works does not mean that the books were written by both parties, but merely that they have both published works on veterinary medicine.

OBITUARY.

After a long illness, Doctor AUGUSTUS D. CARMAN, of Brooklyn, N. Y., died in his 26th year, on the 27th of April. His diploma was dated 1879.

PLEURO-PNEUMONIA.

EXTRACTS FROM THE REPORT OF DR. C. P. LYMAN TO THE COMMISSIONER OF AGRICULTURE.

Continued from page 88.

NEW JERSEY.

The following are the locations of some of the diseased herds in New Jersey at the time of my investigations in February:—

Atlantic County.—Benjamin Gibberson, Port Republic, herd of eleven head. This herd was quarantined October 29, and again on November 28, as chronic cases. Eight animals had been affected by the disease.

H. A. Johnson and William Ramsay, both of Port Republic. The herds belonging to these gentlemen were diseased and in quarantine.

Gloucester County.—Charler B. Leonard, of Paulsboro, has two farms, upon one of which he has a herd of twenty-two animals, six of which are suffering with the plague. He has twenty-eight animals on the homestead farm, only one of which has shown symptoms of the disease. Both herds are in quarantine.

Benjamin G. Lord, of Woodbury, herd of twenty-five head. June 13th six of these animals were suffering with the plague. October 27th there were twenty-one of these animals sick. On November 25th the same number were suffering with the disease, and were all in quarantine. Of the first lot of twenty-five animals, six were attacked and three died. He then bought four or five fresh animals. These remained in good health for five months and twelve days, but of the original animals, twenty-one had suffered with the contagion.

Camden County.—An occasional case of contagious pleuro-pneumonia had been found here, but no great amount of the disease had ever existed. A most thorough system of inspection of cattle coming from Philadelphia has been established here, and its rigid enforcement has undoubtedly been of great service

in preventing the importation and spread of the contagion. From August 28 to December 15, 217 animals known to have been exposed to infection were returned to Philadelphia. Forty-one head of these were suffering with plain and unmistakable symptoms of the malady.

Burlington County.—Howard Stakes, West Hampton, herd of eleven head. Quarantined June 20, but does not obey quarantine regulations.

Job Evan, Mount Holly. Herd quarantined July 11. One acute case.

D. Mulloney, Recklesstown. Lost one animal on January 20.

William Murray, Jacksonville, herd of fourteen head. There have been four acute cases in this herd, and two animals have died. He will probably lose others. The herd was quarantined July 11.

Ocean County.—E. H. Jones, Forked River, herd of twenty-nine head. There have been twenty-seven acute cases in his herd. Six animals were killed on October 2, and on the 15th of the same month the balance were slaughtered. The infection in this herd was brought in some calves purchased in Fortieth street, New York city. From October, 1878, to October, 1879, Mr. Jones lost thirty-two animals by this disease.

At the same place as the above, Moses Street has one animal, Captain Wilson three, and James Holmer twenty-three, all of which are infected and quarantined.

Mercer County.—G. E. Neunamaker, Pennington. On November 17th, three of his animals were suspected. On the 20th of the same month two acute cases had developed, and the herd was quarantined. One animal was slaughtered on January 17th. Two animals recovered and are still on the place.

William Walton, Dutch Neck, herd of thirty-two head. On May 5th one acute case appeared. On May 15th the animal was very sick, and as other cases were developing, the herd was quarantined. The owner did not believe his animals were affected with the plague, and failed to observe the quarantine regulations until one of the animals was killed in order to prove the fact. The herd becoming seriously affected, Mr. Walton sold, on

October 29th, all his animals to a butcher. This herd was infected by a cow purchased in New York. She calved, and her offspring at five weeks old showed the well marked lesions of contagious pleuro-pneumonia.

Monmouth County.—D. C. Robinson, West Freehold. One cow died of the plague on May 13. On the 9th of the same month another cow showed symptoms of the disease, and the herd was quarantined. On June 11th three more animals were sick, one of which has since died, and a second one recovered. The quarantine is continued.

A. D. Voorhis, Adams Station, herd of five head. One of the animals was found sick on October 13, and the herd was quarantined. On the 16th of the same month another animal showed symptoms of disease. One of the affected animals was killed. On November 19, a third animal was taken sick. The herd is still in quarantine.

Pliny Parks, who resides on an adjoining farm, had a herd of eight animals infected. One was killed and the remainder quarantined on October 16.

D. W. Watsons, Perth Amboy, herd of thirteen head. His herd was quarantined March 29, 1879. October 13, nearly six months after, he still had eleven head. On February 5, 1880, having added to his herd, he had thirteen animals, three of which were sick, and the others reported as well (?). The three sick animals were quarantined, and the remainder set at large.

Isaac Morris, Metuchen, herd of fourteen head. The first case of the plague was discovered in this herd on May 22. The animal was taken to the butcher and killed, and the herd quarantined, which is still continued.

Hunterdon County.—Joseph Exton, Clinton, herd of fifty-one head. On June 9, eighteen of the animals were found suffering with the disease and were quarantined. The quarantine is still continued.

Morris County.—D. Frank Carl, Sterling, herd of thirteen head. On March 26, eleven head were sick. On February 20, but five animals remained, one of these showing old lesions. They are in quarantine.

Benjamin Runion, Millington, herd of twenty head, twelve of which were sick on June 13, when the animals were quarantined. Two animals were killed, and on the 26th of June, eight animals were sick out of the eighteen remaining. Two new cases had occurred, but the others were improving. The herd is still in quarantine.

Mary Smith, Chambers street, Newark, herd of five head. On October 24 one animal was reported sick. On the 28th of the same month a second one was attacked, and two were killed. On January 14 the others were reported as "recovered," but were still quarantined.

Alice Kennedy, Roseville, had one animal affected with the plague, which was killed August 14.

Union County.—C. E. Winans, Salem, herd of nine head. Had lost two animals up to August 5. The remainder were sick and in quarantine.

Louis E. Meeker, Salem, herd of thirteen head. Five animals were sick on August 1, when the herd was quarantined. On January 2, having purchased another animal, he had fourteen head. Three of these were chronic cases, and were ordered quarantined for thirty days longer.

J. O'Callighan, Salem, on August 25 had a herd of nine head, with but one animal sick. Up to November 12 he had lost five animals, and had but four left. On January 20 he was visited by the State Inspector, but refused to drive his cattle in from the field for examination. The officer, on threats of personal violence, ordered him to keep up the quarantine, and left without making the examination.

E. A. Bloomfield, Salem, herd of four head, one sick; quarantined August 26. Had one chronic case on January 1; quarantine continued.

F. Saltzman, Roselle, herd of three head; two sick; quarantined September 3. On January 20 one animal was sick, and the herd was still in quarantine.

Bergen County.—C. McMichael, Leonia, herd of twenty-one head; five sick; quarantined April 1. On July 11 had two animals sick, and on January 21 had but five animals left, two of

which were sick ; quarantine continued.

Christian Freund, Closter, herd of ten head ; five sick ; quarantined November 11. The same report of this herd was made on November 19 ; it is still in quarantine.

Hudson County.—The disease exists in the following localities :—

Stables Nos. 133 and 144 Essex street, Jersey City.

Jersey City Heights.—Mary Mullin, No. 106 Thorn street ; J. Lewis, corner Hutton and Sherman streets ; J. Platz, No. 899 Montgomery street ; J. Gurrey, Hopkins street ; Martin Stanton, Hopkins street ; George Reed, No. 87 Germania avenue ; J. Leddy, Nelson and Charles streets ; J. Ryan, No. 25 Laidlaw avenue ; Jonathan Meyer, No. 22 Gardner street ; John Bosch, Congress and Hancock streets. These localities are all in quarantine.

Greenville.—B. O'Neil, Brittain avenue ; William Shaw, opposite cemetery ; Mrs. Corcoran. All quarantined.

Hoboken.—Benjamin Engle, No. 200 Newark avenue ; John Torpey, No. 172 Grand street ; V. Cohen, old Small-Pox Hospital. (Mr. Cohen, having diseased animals, desired a permit to put a fresh cow in his stable. He was refused, but he stated to the officers that he should put her in anyway. This he did, and afterward saw this cow in his stable suffering with the disease in its acute stage) Michael Reynolds, No. 165 Grand street.

West Hoboken.—J. Claude, Cortlandt street ; Harrit Aaron, Newark street ; H. M. Nass, Hallingen ; Mrs. Schmidt, Hackensack plank road ; B. Benjamin, Cusset street ; Kuntzle, Blume street ; Mrs. Schlooler, Blume street ; Ernest Weiss, Demot street, and Oldmeyer, Boulevards.

Secaucus.—Latenstein, county road ; H. Fisher, Secaucus road ; Loeffle, race course ; Bryan Smith, race course ; N. Wohlker, race course ; H. Block, North Bergen.

DELAWARE.

The only information I have as to the prevalence of the disease in Delaware I received in the course of a conversation with Mr. George G. Lobdell, president of the Wilmington Car Wheel

Company. His farm is located in New Castle Hundred, about two miles from Wilmington. In 1858 he had a valuable herd of animals. During this year contagious pleuro-pneumonia broke out among some cattle on a farm about three miles from his place. Fearing the infection of his herd, he commenced to sell off his cattle as he could find purchasers, but before this was accomplished, and perhaps within four months, it reached his farm, and by spring he had but one animal left. For two years after this he was without cattle, but at this time he commenced to stock his farm again. About six years ago the disease was introduced into a herd kept on a farm about two miles from his place. His own cattle remained exempt until about two years ago, when they were again infected. Since then he has been using the fumes of burning sulphur, and has had no fatal cases. Mr. Lobdell informed me that some sort of a law had been passed by the State looking to a suppression of the disease, and that three Commissioners had been appointed by the Governor to superintend and enforce its provisions.

MARYLAND.

Although it has long been known in a general way that contagious pleuro-pneumonia existed among the cattle of this State, no effort on the part of the authorities has ever been made to ascertain with any exactness the localities of the diseased herds. On the 8th of March I proceeded to Baltimore, where I at once called upon Mr. Wm. B. Sands, editor of the *American Farmer*, a gentleman who had greatly interested himself in this matter, and who gave me all the information in his possession as to the localities and extent of the plague in the State, as well as kindly furnishing me with letters of introduction to the officers of the different agricultural societies throughout the State. On the 9th of March I visited Hagerstown, the county seat of Washington county, where on the next morning I called upon P. A. Witner, Esq., secretary of the County Agricultural Society. He said he did not believe there was any disease in the county; that upon the day before there had been a meeting of the Board of Agriculture, at which there had been a good representation from all

the different sections. Those present agreed that they had never known or heard of a case of lung plague in any part of the county.

I was next introduced to Mr. J. B. Bansman, a cattle dealer of this place. In the pursuit of his business he had been all over the county repeatedly, but had never known of a case of the disease. The drift of cattle in this place was entirely from Western Virginia through to Baltimore—never, so far as he knew, from Baltimore here. In his trade he feels very much the evils of the English embargo. It makes a difference to him of at least \$10 per head in the price of his cattle. I then saw Dr. H. J. Cossens, an English veterinary surgeon, who has been located here for the past fifteen years, and whose practice extends over the entire county. He had a considerable experience with the lung plague in England, but had never seen but one case in this country; that was many years ago in Virginia. He is sure there is none in this county, nor has there ever been. Several other gentlemen from different localities were seen, but always with the same result. One farmer had a cow, which he had recently bought, that was coughing and not doing well. I visited her and found her suffering from tuberculosis. In the afternoon I proceeded to Frederick City, the county seat of Frederick County. Here, upon the 11th of March, I called upon Mr. J. W. Baughman, Secretary to the local Agricultural Society. He did not know of any diseased animals, but took me out to the Court House, where we saw and questioned a number of gentlemen from different parts of the county. None of them knew of any cases of this disease; they were very sure that had there been any unusual sickness they would have known of it.

I next saw Dr. P. R. Courtenay, an English veterinary surgeon. He had been here but a comparatively short time and had heard of nothing that caused him to think that there was any of this disease in the county. He kindly offered to bear the matter in mind, and if any cases of the disease came to his knowledge, he would let me know at once. Here, as in Washington County, the whole drift of cattle is from west to east. In the afternoon I went to Westminster, the county seat of Carroll County, and

called upon Colonel W. A. McKellip, President of the County Agricultural Society. He was sure there was no disease of the kind in the county, but he said it was quite a common thing at certain seasons of the year for cattle to be brought here from Baltimore. This I regarded as a very suspicious circumstance, and so asked for an introduction to some cattle dealers in town. This was kindly granted, and I proceeded to call upon Mr. Edward Lynch. He said: "Farmers hereabout generally make milk for the Baltimore market, and procure their cows from among themselves; but from the time that grass comes up until late in the fall of the year some of them are in the habit of feeding cattle; that the cattle for this purpose are generally bought at the "Scales" in Baltimore; that in this way last fall Mr. Samuel Cover, of Silver Run, this county, procured some stock which, after having been on his place for a short time, developed disease of some sort; some died, and some that were sick, got well. Also, a Mr. Beacham, of Westminster, had had trouble of a similar nature for some time past. In a general way, he knew that the farmers hereabout were somewhat frightened about contagious pleuro-pneumonia. On March 12, I drove to the farm of Mr. Samuel Cover, above referred to, at Silver Run, and found three cases of chronic contagious pleuro-pneumonia. This gentleman stated that he had got the disease last fall through some steers that came from Southwestern Virginia, but which had stopped at the Baltimore stock yards for some little time, at which place he had bought them. Some four or five weeks after he got them, the disease broke out among them. He had at the time some eighty head of neat stock. Of these fifteen were sick. When the disease first showed itself, he put all the sick animals in a building by themselves, and had all his stables thoroughly disinfected. This was kept up all the time, and the places repeatedly whitewashed. In all, four animals died—two of them the Baltimore steers; the other two were cows which he had had for some time. Mr. Coven further says that now, when he gets eltate, he always puts them by themselves in a building entirely away from his regular cow stables, and hopes in this way to avoid any further outbreaks among his herds.

Returning to Baltimore on March 7 in company with Dr. Daniel Le May, a veterinary surgeon, I visited a herd of milch cows kept in a dairy in Woodbury, near Baltimore. Here we found one acute and two chronic cases of the plague. The man in charge said that he had got through with the disease, from which he had suffered greatly some two months ago, by selling out all his sick animals. From here we went to another large dairy in the same neighborhood. The gentlemanly owner here informed us that he had had none of the disease for some time; that his plan was to buy often and sell often. In this way he found he could keep up his milking stock and keep rid of disease. From here we visited a near neighbor living on the direct road to the city. In answer to questions this man said that he did not know if his neighbor (the one from whom we had just come) called it having the disease or not, but that he drove many a sick one past his house on his way to the Baltimore market. He (our present informer) was free to say that he followed the same practice himself, and had done so ever since he lost his first eight animals. He supposed this was not right, but his neighbors did it, and so he did. Summer was invariably the worst time thereabout. The next place visited was about two miles distant and on a different road. The dairyman here had suffered greatly in the past, but thought that now by selling the sick ones he had nearly rid himself of the plague.

MARCH 18.—We drove in several directions around the city and found the disease, or its effects, in all the herds except one that we visited.

MARCH 19.—To-day we examined a number of the cow stables in the city itself, in which many chronic and a few acute cases were found.

MARCH 22.—I went to Harford County, where the disease was reported as existing in a number of different directions. However, we concluded to visit the farm of Senator George A. Williams, whose herd of fine Alderneys have been suffering more or less from the scourge for the past two years. Here among several chronic cases was one that, although he had been sick for some time, was making no progress toward a good recov-

ery. This animal the overseer consented to let us kill. The autopsy showed, well marked, the lesions of the disease. The infection here, as with all the other outbreaks hereabouts, came from Baltimore. At this point further investigations were given up for the present, and it still remains, in order to properly finish this report, to make an examination of the remainder of this State, the District of Columbia and Virginia, in all of which places it is believed that contagious pleuro pneumonia of cattle exists to a greater or less extent.

WHAT THE INVESTIGATION SHOWS.

As a result of my investigations thus far I find this ruinous foreign plague actually existing among cattle in the following States:—

CONNECTICUT.—In Fairfax County.

NEW YORK.—In New York, Westchester, Putnam, Kings and Queens Counties.

NEW JERSEY.—In Atlantic, Gloucester, Camden, Burlington, Ocean, Mercer, Monmouth, Middlesex, Hunterdon, Morris, Essex, Union, Bergen and Hudson Counties.

PENNSYLVANIA.—In Philadelphia, Chester, Montgomery, Bucks, Lehigh, Cumberland, York, Delaware, Lancaster and Adams Counties.

MARYLAND.—In Carroll, Baltimore, Harford and Cecil Counties. The middle and southwestern portions of this State have not yet been visited.

No examination has as yet been made in the District of Columbia, or of the infected territory of Virginia; but as the plague prevailed quite extensively in both of these localities last season, it will no doubt be found still in existence when the investigation takes place.

EXTRACTS FROM FOREIGN JOURNALS.

VETERINARY SCIENCE IN AMERICA.

To the Editors of the Veterinarian.

DEAR SIRS,—In the January number of the *Veterinarian* for 1880 I noticed a paper, contributed by John H. Steel, M. R. C. V. S., F. Z. S., &c., which finished up as follows :—"If any American reader notes errors let him be assured that we shall be anxious to correct our statements when proven to be in the wrong." Thanks for the privilege. That the writer has been misled by the unjust, unfair, and prejudicial statements of the editor of the *American Veterinary Review* is quite apparent. That errors and omissions occur will readily be detected by the impartial "American reader." I very willingly accord all due credit to Prof. A. Liantard for his praiseworthy efforts in the advancement of veterinary science in this country. It should be recollected, however, that at the time he came to the United States the rough road travelled by his predecessors was made comparatively smooth, leaving him an easy victory. That I may present the subject fairly and impartially to the readers of the *Veterinarian*, permit me to go back to the early history of veterinary advancement in the City of Philadelphia. My father, Robert Jennings, was the first to publicly advocate the cause of veterinary science in this country. He was not a graduated veterinary surgeon, but had read medicine for several years, and being well posted in comparative anatomy, commenced in the winter of 1846 a course of veterinary lectures to a class of medical students in the City of Philadelphia, which was continued during the sessions of the medical colleges for several years. In 1850 he conceived the idea of organizing a veterinary college. He made known his plans to Austin Miller, M. R. C. V. S., and John Scott, M. R. C. V. S., (the only graduated V. S. in the city,) both of whom regarded the movement as premature, giving it the cold shoulder. He now laid his scheme before Prof. Wm. Gibson, of the Pennsylvania Medical University, and Prof. James Bryan, of the Philadelphia Medical College, both of

whom not only encouraged the measure, but personally solicited and obtained the names of the following prominent citizens of Pennsylvania to a petition asking the State Legislature for an Act of Incorporation for the Veterinary College of Philadelphia:—Gen. George Cadwalader, Wm. Gibson, M. D., John Philips, M. D., Alfred L. Elwyn, M. D., James Bryan, M. D., Hon. Frederick Watts, Gen. George McKeim, James Gowan, Hon. Geo. W. Woodward, Stetchley Morton, Alonzo Potter, D. D., and L. L. Ward, which charter was granted without delay, and duly signed as follows:—"John S. Rhey, *Speaker of the House of Representatives*, John H. Walker, *Speaker of the Senate*. Approved the Fifteenth day of April, A. D., one thousand eight hundred and fifty-two, Wm. Bigler, *Governor of the State of Pennsylvania*." This, the first veterinary college chartered in America, the date fully proves. Robert Jennings having been the recipient of an honorary diploma from the board of directors, was placed at the head of the new institution. Early in 1853 he presented the following as the faculty of the college:—W. W. Fraley, Prof. of Materia Medica and Therapeutics, T. J. Corbyn, Prof. of Pathology and Surgery, John Scott, M. R. C. V. S., Prof. of Practice of Medicine with reference to all domestic animals, Geo. W. Bowler, Prof. of Medical Chemistry and Pharmacy, Robt. Jennings, Prof. of Anatomy, Physiology, and Operative Surgery. Negotiations were entered into for the building of a veterinary college, the plan for which had been prepared by an architect, Mr. John Notman, a cousin of my father's. While these negotiations were pending, Drs. Corbyn, Fraley, and Scott tendered their resignations as members of the faculty. This was a stunning blow to the new enterprise, and for the time stopped further progress. This blow, severe as it was, did not discourage my father. He now directed his efforts in harmonizing the graduated and non-graduated veterinary surgeons, calling a meeting of such at his office, April 5th, 1854, urging the formation of a veterinary association for mutual improvement, T. J. Corbyn, W. W. Fraley, G. W. Bowler, M. Roberts, John Scott, Robt. Jennings, A. Tegtmeier and R. Evans being present, Evans and Scott being the only graduated surgeons. After discussing the merits of the question,

it was resolved to meet at the same place on the evening of May 7th, for the purpose of permanent organization. At the appointed time there were no absentees. Professors Wm. Gibson and James Bryan were present as patrons of the new society, to be known as the American Veterinary Association. The meeting was called to order by Prof. Bryan taking the chair, and Mr. Roberts acting as secretary, when the following officers were elected :—President, T. J. Corbyn ; Vice-Presidents, James Bryan, M. D., and W. W. Fraley ; Secretary, M. Roberts ; Corresponding Secretary, John Scott ; Treasurer, R. Jennings ; Librarian, A. Tegtmeier, The objects : the cultivation of fraternal feelings among veterinary practitioners and the elevation of veterinary science. Ere the infant was six months old it was recognized by the Pennsylvania State Agricultural Society awarding it a silver medal for its fine display of anatomical and pathological specimens at the State Fair, September 29th, 1854, an engraving of which I send you. Notice of this organization will be found in the first volume of the *American Veterinary Journal*, published in Boston in 1855, p. 242. In the same volume, p. 341, Dr. C. M. Wood, of Boston, says : “ I noticed an article on p. 242 by Mr. Jennings, V.S. I subscribe to most of the opinions and views expressed by Dr. J., and unite with him in the satisfaction he manifests for the recent progress of veterinary science in this country.” He says further, p. 342 : “ Dr. Jennings, the writer of the paper named at the head of this article, has done much towards dispersing the popular delusion in regard to the treatment of our domestic animals.” Again (same page) ; “ We rejoice to find by Dr. R. Jennings’ paper that a spirit of emulation animates all parts of our country at this time in regard to this subject. That in the great State of New York efforts are making to establish a veterinary college. In Philadelphia there has been formed an ‘American Veterinary Association,’ which is already distinguished. Boston is ahead of New York at the present, but that giant city has only to will it and she surpasses all others.” In the fall of 1854 my father was called to Cleveland to fill the veterinary chair in the State Agricultural College of Ohio, which position he held until the suspension of the college in the spring of 1857, when he returned to

Philadelphia again to engage in the interest of the college movement. Shortly after his return he presented to the board of directors the following faculty:—W. W. Fraley, Prof. of Materia Medica and Therapeutics; J. J. Corbyn, Prof. of Pathology, Surgery, and Practice of Medicine, in reference to all domestic animals; G. W. Bowler, Prof. of Medical Chemistry and Pharmacy; R. Jennings, Prof. of Anatomy, Physiology, and Operative Surgery; which was accepted. A building was rented at the corner of Sixth and Master Streets, fitted up with a spacious museum, in which was deposited nearly 2000 specimens, among which was an articulated skeleton of a horse, a pony, a mule, a cow, a hog, and a dog, a lecture room, library, laboratory, dissecting room, and infirmary, which were thrown open to the public on Tuesday evening of each week, at which time free lectures were delivered in the lecture room during the winter months. Free clinics were held at the infirmary every Wednesday and Saturday, from November 1st to March 1st. Unfortunately for the institution, Drs. Fraley and Corbyn resigned from the faculty before the first course of lectures were over; my father and Dr. Bowler, however, continued the course to the end, delivering lectures which should have been done by others. There were no fees attached to these positions, the current expenses being paid by the faculty and trustees. The following year an appeal was made to the Philadelphia Agricultural Society, which was referred to the executive committee, who at the following meeting of the society made the following report:—"That they had visited the museum and library of the Veterinary College and were surprised to find it so valuable and interesting. They were so favorably impressed that they ceased to doubt the propriety of the application," and therefore offered the following resolution:—"That the use of the rooms of the Agricultural Society be granted to the Veterinary College of Philadelphia for holding their lectures the coming winter." Dr. A. L. Elwyn seconded the resolution, and spoke earnestly in favor of inviting the faculty of the college to deliver their "course of lectures upon horseology, under the auspices of this Society," which received the unanimous vote of the Society. Dr. Bowler resigned after

the season of 1859-60 ended, returning to Cincinnati, where he left a lucrative practice to assist in this worthy enterprise. Robt. McClure was then appointed to fill the vacancy. In 1860 the following letter was received from the Veterinary College of Alfort, France, addressed to my father, which I have translated :

IMPERIAL VETERINARY SCHOOL OF ALFORT, }
ALFORT, MARCH 7th, 1860. }

DEAR SIR AND BROTHER,—My colleagues, the Professors of the School of Alfort, and I are very thankful to you for the honor that you are well pleased to do us in proposing us to be members of the Veterinary College of Philadelphia.

Therefore it is with pleasure that I send you, as you wish it, my name, giving the names also of the five professors, my colleagues, who are sending to you and to your honorable brothers their best respects and most sincere thanks.

Please accept, dear sir and brother, the expression of my own gratitude and of my most distinguished feelings.

(Signed)

ENG. RENAULT,

Director of the School of Alfort.

Messrs. Renault, Eng. Thos. Eli.....	Director.
Delafond, Henry Mam. On.....	Professor.
Bouley, Henry Marie.....	“
Magne, Jean Henry.....	“
Goubaux, Arm. Chas.....	“
Sannier, Jos.....	“

The college enjoyed the privileges extended by the Philadelphia Agricultural Society until 1866, when it suspended further operations, retiring from active service without a stain upon its character, the graduates of which hold legal diplomas, which are protected by law, as are those legally issued by other medical institutions. My father was the principal of the college from its commencement to the end, in which no irregularities were known, and to say : “*Prof. McClure, M.D., V.S., who was the Veterinary College of Philadelphia, as the Officers and Prof. of the School by the authority vested in us by the sovereign power of the State of Pennsylvania confer the degree of veterinary medicine and surgery.*” Unfortunately he appended to the diploma announcing

this a signature not his own, and so experienced the sovereignty of his state under the form of a visit from a constable, and resulting in incarceration." The impartial reader will fail to recognize the above statement as true, when it bears upon its face the fact that "incarceration" was not the result of issuing bogus diplomas, but from the fact of one of the officers of the college having his name upon the worthless sheet without his having put it there, upon which the conviction took place, proving the charge as above, that he, "McClure, was the Veterinary College of Philadelphia," false, if not malicious. At the time these irregularities occurred the college doors had been closed ten years, therefore such statements are not only unjust, but grossly untrue. The name of A. L. Elwyn, M.D., was upon all legal diplomas issued by the college, as was also my father's, but his name did not appear upon the worthless sheets, neither was the seal of the college upon them, but instead a seal purporting to be of the Merchant's Veterinary College, an institution unknown to the veterinary profession. The above facts Prof. Liautard ought to have known, and not unjustly stigmatize the graduates of a college laboring under difficulties which had been removed previous to his coming to the United States. The first effort to establish a veterinary college in the City of New York, though backed by many and energetic professors, Capt. Rolston, and Dr. John Busteed proves this fact.

"Philadelphia has an uneviable notoriety in veterinary history in connection with the 'bogus degrees;' the fame of which, extending to this side of the Atlantic, has rendered us suspicious of qualifications." This conclusion appears more in the form of gossip or malice than of fact. Had the writer connected the 'bogus' reputation with human medicine he would have been correct. It was from this source, and not the veterinary, that Philadelphia became so notorious. The proof is given as follows in the *Philadelphia Record* :—"There is a badge of fraud in the very selection of the name of the bogus diploma factory recently exposed in these columns. It is so closely similar to that of the University of Pennsylvania, known and honored throughout the world, as to be easily confounded with it in the minds of the

unwary. The title of a fraudulent institution now commanding so considerable a degree of public attention was probably adopted with a deliberate purpose of deception. Like colorable imitation of trade marks and copyrights, it is a manifest counterfeit. The University of Pennsylvania is located in Philadelphia, and it annually graduates a large number of physicians. The 'Philadelphia University of Medicine' might easily pass for it at a distance from the city, and a degree given by this miserable make-believe concern might readily be mistaken for the *imprimatur* of what is recognized as one of the foremost of the great medical schools of the United States. Evidently the main object of this swindle, apart from the pecuniary purpose it subserves to those who run it, is to supply credentials to intending quacks, by which these villainous cheats may be helped to impose upon the public. The wickedness of such a fraud it is not needful to enlarge upon. The injury done to properly instructed and reputable practitioners of the healing art and the disgrace brought upon the fair fame of this city by its existence here are sufficiently bad results; but worse than these is the sending forth to work havoc upon the community at large of licensed murderers, whose pills and powders are potent only to kill such patients as may fall into their hands. A sad feature of this discreditable business is the connection with it of several ministers of the Gospel. Some of these perhaps amenable rather to the charge of thoughtlessness and indiscretion than of deliberate and conscious criminality. The facility with which names of the highest respectability are obtained as 'trustees,' 'visitors,' &c., of unworthy institutions and enterprises of a questionable character has become a great abuse. It would be a point gained if the easy-going gentlemen who lend their credit to these improper uses could be made to realize their responsibility, and an occasional recoil upon them of their good-natured folly is not altogether to be regretted. The ecclesiastical authority to which the clergymen alluded to are answerable has already taken steps towards an investigation of their connection with the counterfeit 'degree' mill. There is no reason to suspect that there will be any whitewashing in the case. Such of the persons implicated as are found to have a guilty knowledge of the

fraud will, no doubt, be duly punished." Is the above evidence sufficient to prove the error made in placing the "bogus diploma" business at the closed doors of the veterinary schools of Philadelphia?

The Pennsylvania College of Veterinary Surgeons, chartered in 1866 to take the place of the old school, was in the interest of and under the exclusive control of veterinary surgeons. The name of McClure does not appear among the incorporators, neither will it be found associated with the faculty of the college, as you will see by the announcement and a copy of the charter, which I send you. These facts should prove his unpopularity among the veterinary profession in the City of Philadelphia. This institution fitted up a hall at No. 256 North Fifth Street, where two winter courses of lectures were delivered by the faculty. The finances of the college being in a healthy condition, it was decided to fit up a building better adapted to the purposes of a veterinary college. A building was rented and fitted up at the corner of Sixth Street and Columbia Avenue, which exhausted the treasury, compelling a direct tax upon each individual member. Two courses of lectures were delivered in this building, when, to save expense, the doors were closed in 1870, since which time quarterly meetings have been held in Diligent Hall. No effort as yet has been made to reorganize the college. In connection with this college the writer says: "In 1866 the Pennsylvania College of Veterinary Surgeons was granted a charter. It announced six officers, among them Isaiah Michener, one of the leading men of his State. It had no buildings, gave few, if any lectures; we may, therefore, conclude all Pennsylvania veterinary lectures as worthless." To refute such slanderous statements I have only to say that the veterinary colleges of Philadelphia held their annual commencements in public; the exercises, together with the names of the graduating classes, were regularly reported in all the daily papers in Philadelphia, as are those of other legitimate medical colleges. If such evidence is not sufficient to wipe out the infamous charges made by the enemies of the Philadelphia veterinary schools, I can furnish recorded evidence from other sources, which are too voluminous to offer at this time. No charge was ever made in

the City of Philadelphia against either of these institutions, the charge being wholly of an individual character against McClure. From these facts, which we assert to be true in every particular, the impartial reader will readily acknowledge the injustice done these schools, but more particularly to their graduates. The first or January number of the *American Veterinary Review* I did not see, or I would have answered the calumny at once.

In the list of American veterinary works mentioned by the editor of the *American Veterinary Review* I notice "works by Jennings and McClure." Now, I do not wish to charge Prof. Liantard with maliciously associating these names, but rather attribute it to want of information upon the subject. My father's works, 'The Horse and his Diseases,' published in 1860, 'Cattle and their Diseases,' in 1862, 'Sheep, Swine, and Poultry,' in 1863, and 'Horse Training made Easy,' in 1865, have no other name associated with them, nor is my father's name associated in any manner with any of McClure's publications. The works themselves prove the assertion. A review of my father's first work, by Prof. John Gamgee, will be found in vol. iii of the *Edinburgh Veterinary Review*, 1861; in which he says: "The above work favorably contrasts with other American publications on veterinary science. It indicates care in preparation and knowledge on many subjects connected with veterinary science. It is not quite up to the day when compared with many European works, and on some subjects remarkable deficiencies are observed." It is quite as remarkable that Prof. Gamgee should expect an humble author in a new country, where veterinary colleges hardly had a foothold, to compare with European authors, who have the advantage of more than half a century. He finishes his review as follows:—"We repeat that, on the whole, Mr. Jennings has proved in advance of his countrymen." Considering that Prof. Gamgee is one of the most severe critics known to the world, I regard it as very complimentary to my father. The United States Veterinary Medical Association was also planned and organized through the efforts of my father, proof of which is at your own door in an article that appeared in the *North American and United States Gazette of Philadelphia*, March 5th, 1863, and

copied in the *Edinburgh Veterinary Review* of 1863, page 253. As the article is a long one, we simply make one or two quotations. It reads as follows:—"The faculty and graduates at the commencement of the Philadelphia Veterinary College met afterwards at the Wetherill House to partake of a collation and indulge in social conversation. Though the subject was 'Horseology,' it was full of interest. The college is the first in this country; its faculty are men of superior intelligence—Robert Jennings, Robert McClure, Charles M. Wood, and A. S. Copeman. For this reason the Agricultural Society of Philadelphia recognized and encouraged the institution from its inception." An error occurs in the above regarding Prof. Woods and Copeman. At the time the college was negotiating with these gentlemen to place their names with the faculty, their decision not yet having been received, is where the mistake has been made. Continuing: "Mr. Jennings suggested that this college, with its graduates during the last five years, should establish a national veterinary association, and ultimately establish a veterinary journal." Thus recording the facts in advance of its organization. Dr. C. M. Wood writes:

Boston, June 30th, 1859.

FRIEND JENNINGS,—Yours of the 11th of April, unanswered, is now before me. As to the "National Association," I fully agree with you, and both myself and friends here will hold ourselves in readiness to attend a meeting in New York City, for the purpose of such an organization, at any time that will best suit the convenience of parties desirous to unite with us in the cause. Perhaps you had better consult with your friends on the subject and inform us of their views, either Copeman or myself, and we will attend to it in our parts of this union. "*Union*," did I say? Yes, that is just what we want. I remain, with respect,

Yours truly,

CHAS. M. WOOD.

Boston, May 14th, 1863.

DR. JENNINGS,

(*Four years later.*)

DEAR SIR,—Your letter of May 2d has come to hand, and reminds me of a previous one which has been accidentally laid

aside and forgotten. I am aware of the necessity of co-operation of all the veterinary practitioners to give strength and efficiency to their order, but permit me to say that I beg to be informed as to what are the qualifications required in such as may form the proposed convention. There are many persons who have taken up the practice of veterinary medicine and surgery who have had no proper instruction in these subjects, and are entirely ignorant of the principles on which they are founded. They have assumed the title and duties of professional men only for the name and living may be received from it. Now, my dear sir, these are such men as I do not desire to associate with. I do not say this to depreciate your efforts in the cause of veterinary medicine and surgical science, but there are such *men* as I have described, and you know there are. At a meeting of our vets. here last evening it was voted for several to come. But we must wait your reply to this for information.

I remain, friend Jennings,

Yours truly,

CHAS. M. WOOD.

OYSTER BAY, LONG ISLAND, May 13th, 1863.

FRIEND JENNINGS,—I have just returned from New York. I called upon Chas. Stetson, Esq., of Astor House, and communicated to him our proposed plans for the National Convention to be held on the 9th June. He is a great admirer of the profession, and is willing to lend us all the assistance that may lay in his power. He offered me gratuitously the use of the large parlor, to accommodate seventy-five or one hundred gentlemen. I now submit his kind offer to you. I called upon Dr. Busteed. He thinks well of this. To give the thing tone and respectability, we must go to a respectable place, and the Astor House has a widespread reputation as such. Bring all the vets. along; do not let one of them back out. Answer by return mail, and give me your views, but do not have the call published until I make the arrangements with Mr. Stetson.

Yours truly,

WM. J. McCONN

NEW YORK, March 28th, 1863. }
 207 FOURTH AVENUE. }

DEAR SIR,—I observed in a recent number of *Wilkes' Spirit of the Times* that at a meeting of veterinary surgeons lately held in Philadelphia, it was proposed to form a "National Veterinary Association;" that resolutions to try and effect that purpose had been adopted; that Mr. Wisdom and yourself were requested to correspond with "such members of the profession as they may be acquainted with, soliciting their *aid* in support of the proposed measure and their attendance at the Convention when held." The wording of the resolutions would seem to debar all who are not veterinary surgeons from taking any part or interest in the formation of the association. Although not a veterinary surgeon, I am deeply interested in all that pertains to that much (in this country) neglected and important science. I have been for some years trying to elevate that branch of comparative anatomy to a more eminent position than it occupies at present. It will afford me much pleasure if I can in any manner assist you or your associates in perfecting the object proposed. I think with you that the time has come for veterinary surgeons and others practicing or interested in the art to claim for themselves a status to which they are, when properly educated, entitled. I think New York would be the most appropriate place for the first meeting, and that Agassiz would be the most suitable person to deliver the introductory lecture. I believe my suggestion would meet the views of our mutual friend Mr. Copeman. Hoping that your "long cherished desire" may be speedily accomplished,

I remain, very respectfully,

R. JENNINGS, ESQ.,

JOHN BUSTEED.

Veterinary Surgeon.

124 MACDOUGAL STREET, }
 NEW YORK, May 4th, 1863. }

DEAR SIR,—In answer to your letter of May 2d for your kindness in appointing me as one of a committee for forming a National Association to advance veterinary science in this country, where it is greatly needed, I am obliged to decline the honor

as my health is very much impaired by close attention to the duties of my profession, and I think of going to Europe with the hope of recuperating myself by a little rest. I must convey to you my best wishes for your success in so praiseworthy an undertaking even at this late date.

I remain,

Yours truly,

R. JENNINGS, V. S.

CHAS. C. GRICE, M.R.C.V.S.

UTICA, N. Y., April 4th, 1863.

DEAR SIR,—In acknowledging the receipt of your favor of yesterday I beg to present for the earnest consideration of yourself and associates the propriety of making some alteration in the name or title, "National Veterinary Association." You too well know the bitter enmity, strong prejudice, and mean petty jealousy now existing among veterinary surgeons in the U. S. Now it occurs to me that a plan can be devised by which all opposition may be neutralized, if not entirely overcome. The title, "National Veterinary Association," in my humble opinion, is another specimen of "lofty tumbling," of which we have already had too many. I know the delicate nature of this matter, and shall content myself with a simple statement of fact. If the gentlemen would consent to change the *title* of the association, say to the "*National Society for the Advancement of Veterinary Science*," or knowledge, a door would at once be opened for the admission of all competent and honorable workmen, all true patrons of our art, as well as those who admire knowledge simply for its real worth and power. By adopting such a *name* all petty feeling and strife may be prevented. Doctors know the value of this term; proper rules would effectually exclude all *unworthy* persons. "I for one" am anxious to see "free trade" principles adopted. The number of veterinary surgeons, "graduates" of European colleges, are but a mere fraction of those practicing under that title in our cities and towns, and, to be candid, I must admit that some of these "home-made vets.," by years of patient study, close and untiring observation, added to a long and extensive experience, in many respects are better "qualified to practice"

than some of the "two lesson" (graduates) from "abroad." Let a liberal *code* be adopted that will bring together a large portion of the "working class" of our profession. By all means hold the first meeting in New York City. Before preparing any remarks for the public, I should be pleased to get the views of yourself and colleagues upon the "amendment" to title herein advocated. Trusting that you will favor me by an early notice,

I remain, truly yours,

To ROBT. JENNINGS, V. S.

A. S. COPEMAN.

179 LEXINGTON AVENUE,
NEW YORK, 15 May, 1863. }

DEAR SIR,—I received yours of the 14th inst. appointing me to confer with the members of the veterinary profession in this city in making arrangements for a meeting to be held here on the 9th of June next. My acquaintance with my professional brethren is exceedingly limited, having been myself a short time resident in America. I will, however, be most happy to confer with them upon any subject pertaining to the advancement of veterinary education and science.

I remain, dear sir,

Yours obediently,

R. JENNINGS, ESQ.

A. LIAUTARD.

COLLEGE PLACE, BROOKLYN, N. Y. }
May 15th, 1863. }

R. JENNINGS, ESQ.

DEAR SIR,—I have just received your letter, the objects of which I highly approve, but as I have been out of practice some years, and am much engaged in other business, I am compelled to decline serving on the committee. At the same time I would suggest my adopted son, Alfred Large, veterinary surgeon and member of the R. C. V. S. of London, in my place. If this alteration meets the views of yourself and friends, write me by return of post, and he will attend to the matter without delay.

Yours very respectfully,

R. M. CURTIS.

98 EAST THIRTEENTH STREET, NEW YORK, }
May 15th, 1863. }

R. JENNINGS, Esq.

SIR,—I am in receipt of your favor of the 14th inst., and would most respectfully decline the honor you would confer upon me by appointing me upon a committee for the diffusion and advancement of veterinary knowledge. My business and other engagements are such at this particular time that it precludes me from taking an active share in this very meritorious work. Hoping my refusing to act may not seriously incommode you in your undertaking,

I am, yours very respectfully,

W. W. A. M. LOCKHART, V.S.

The preceding letters are copied verbatim. Many others of a similar character were received by my father upon the same subject. My object in offering them is to give credit to whom it belongs, which our New York and Boston friends would rob Philadelphia of, which I presume they will not attempt to deny.

Very respectfully yours,

ROBERT JENNINGS, Jun.

PITTSBURG, PENNSYLVANIA.

CORRESPONDENCE.

Editor American Veterinary Review :—

If your readers are not “surfeited” with the subject of contagious pleuro-pneumonia, allow me to call the attention of the public to the necessary steps which the nature of this disease and its past history conclusively prove can *alone* be successful in exterminating the malady from our midst. Are the methods now employed by the different States such as give us a guarantee of a speedy and sure eradication of this plague from the present infected States, or that will prevent its westward spread? If they are not, what measures must we substitute to obtain the end in view? In other words, can we ever be entirely clear of pleuro-

pneumonia with the imperfect legislation and the many restrictions now placed upon us? We fear not. We propose then, to state in general terms what should be done, and compare this with the measures now taken in the different States and see how they correspond.

It is but just to say, however, that American people and American legislatures are almost, if not entirely, ignorant of the measures necessary to control this and other contagious diseases of the domestic animals. Hence, we should regard all present efforts as *gropings in the right direction*, and endeavor to patiently direct and develop rather than discourage and thwart, the only measures (imperfect and insufficient as they are) which our people will to-day endorse. All delays are indeed dangerous, and we must predict that more ultra measures than are now adopted must soon be put in force if the complete "stamping-out" of contagious pleuro-pneumonia from the U. S. is to be a success.

That this malady here exists; that it is contagious; that it is not indigenous to this country, that its incubative stage is uncertain in its duration, sometimes very short, again very long; that so-called "recovered" cases may and *do* spread the contagion to healthy animals with which they come in contact—all these are points settled beyond dispute. Starting with the above facts as a basis, and remembering that *different* States are invaded by this disease, the first and prime element of success in its extermination consists in *united* and *harmonious* action by each and all the States.

The short experience of the past proves conclusively that such a unanimity of action as is required to effect any *permanent* good is not to be hoped for as long as *individual States* control and direct this work. What then?

Plainly to place the matter in the hands of the National Government in such a manner as will best secure the sympathy and coöperation of every State, whether actually invaded, or in danger of becoming so.

There are a few prominent rocks upon which this effort is in danger of being wrecked, i.e.: political influences, the appointment of persons unacquainted with the nature or extent of the

disease, or of those who can be scared into inaction by personal grievances of the inconveniences which arise in infected districts. These difficulties and many more, *which exist now*, must be met and overcome.

The system of quarantine, if it is to be an *effectual aid* toward eradicating the lung-plague, must be more rigidly enforced. Restrictions much more severe than at present imposed must be placed upon the *movements* of cattle. *This is imperative.* So long as this avenue is left open to the contagion, we cannot expect any permanent diminution of the disease. Pleuro-pneumonia can never be exterminated from our borders by quarantine and disinfection alone, unless within infected farms, neighborhoods, and conveyances of all descriptions, the removal or introduction, or passing through of animals or other means of contagion be for a time *entirely suspended*. So long as cattle pass into and from infected yards or districts, to any and all parts with almost absolutely *no* restrictions, as at present, it savors of irony to say that we are getting rid of the disease. We are, at best, only getting rid of it at one place by sending it to another. There seems nothing plainer than that to kill every infected animal, and *every animal that has been exposed to the contagion*; to quarantine and disinfect the premises, vehicles, etc.; to forbid entirely all movements of cattle in such districts for from two to three months is the *cheapest* and possibly the *only* way of ever getting rid of this scourge. As has already been suggested, the National Commission should number a veterinarian as *one of its board*, and not a mere agent or hanger-on; that these Commissioners be appointed, conditional on the faithful and rigid discharge of their duties, for not less than ten years, and at such a salary as will command the undivided attention of *honest* and *proficient* men.

It is essential that the National and State authorities consist of men who have sufficient intimacy or knowledge of the disease in question to recognize it as a *specific, contagious, bovine* scourge, and as one that invariably presents its own peculiar pathological lesions; post-mortem appearances, which, when fully developed, are characteristic of this disease and no other; that they understand and guard against not only the probable but every possible

means of contagion, and be able to direct, with safety, all movements of cattle.

The Commissioners must be men who have their aim single toward the one object, *the radical extermination of the malady*. Toward this end all other interests must subserve. If not, then the present efforts to eradicate the lung-plague will prove abortive and of no permanent avail.

D. V. S.

EXCHANGES, ETC., RECEIVED.

EXCHANGES.—Journal de Zootechnie, Medical Record, Medical and Surgical Reporter, Live Stock Journal, Prairie Farmer, Country Gentleman, Scientific American, American Agriculturist, Turf, Field and Farm, Clinica Veterinaria, Annales de Belgique, Veterinary Journal, Veterinarian, Recueil de Medecine Veterinaire, Archives Veterinaires, Revue fur Thierheilkunde und Thierzucht, Revue fur Wissenschaftliche und Practische Thierheilkunde, Gazette Medicale, Annals of the Anatomical and Surgical Society, Monatsschrift des Vereines des Thierarzte.

PAMPHLETS.—Bulletin de la Société Centrale de Medecine Veterinaire, Announcement New Veterinary College (Grayfield, Edinburgh).

BOOKS.—Transactions of the American Medical Association, 1879.

JOURNALS.—The Illustrated Journal of Agriculture.

COMMUNICATIONS.—D. V. S., W. Manz, Student.

AMERICAN VETERINARY REVIEW,

JULY, 1880.

ORIGINAL ARTICLES.

CHICKEN CHOLERA.

STUDY ON THE CONDITIONS OF THE NON-RECIDIVITY OF THE
DISEASE AND OF SOME OTHER OF ITS CHARACTERS.

By M. L. PASTEUR.*

In a former communication, I announced, among other conclusions, that chicken cholera was produced by a microscopical parasite; that there existed an attenuated virus of this disease; and lastly, that one or several inoculations with that virus would insure protection from the fatal effects of a subsequent inoculation.† From the strong similarities that our study discovers between the effects of vaccine and human variola, it becomes an

* Translated by A. Liautard.

† Messrs. Moritz and Perroncito, as well as Mr. Toussaint, who went further than they, had left the question of the parallelism of that affection doubtful. In my preceding note, I expressed myself in a different manner; but I have since learned that Mr. Toussaint had failed in his endeavors to obtain successive cultures in neutralized urine, a merit which, however, he does not claim, though he still enjoys the credit of the endeavor.

inquiry of interest to know whether the immunity referred to can be absolute, not only respecting the regions of the body which have received the preventive inoculation, but also what should be the point selected for the operation, and as well, the mode of introduction of the disease and the degree of receptivity in the animal chosen for the experiment.*

To explain more clearly and more briefly the results I wish to relate, allow me to use the word *vaccinate* in referring to the inoculation of the chicken with attenuated virus. This admitted, I may say, on the faith of many experiments, that the effects of vaccination vary with chickens; that some resist a very active virus after one preventive inoculation of weak virus; that others need two and even three preventive inoculations; that in all cases, in fact, any preventive inoculation has its own proper action, and it always protects in a certain measure; that, in a word, though there will always be degrees of effectiveness, it is always possible to accomplish a successful vaccination—that is, to bring the chicken to a condition where the most active virus will cease to be effective.

A brief recital of the methods and results of the experiments which furnished the demonstration of my views, will render their statements more intelligible:

I take eighty fresh hens—I call them *fresh* because they never had the disease either spontaneously or in any other way. Of these I inoculate twenty with the lymph of the most virulent character, and *all die*. From the sixty remaining, I inoculate

*What I have heard or read of human vaccine, and what I may infer from my own experiments on chicken cholera, induce me to believe that vaccination seldom produces its maximum effect. Indeed, where is the vaccinator who would without apprehension expose his vaccinated patients to a fatal epidemic of variola? Reports exist of vaccinated persons who had previously had variola, and in whom vaccination proved afterwards efficacious, who subsequently suffered attacks of variola and had had this disease three times. Dr. Brouardel reports: Mrs. C. D. vaccinated in her youth; came to Passy when 30 years old. Her face was pitted from variola, when at 20 or 22 years. In 1868 she was treated for another attack of confluent small-pox. She came to Paris in 1869; was successfully vaccinated in 1870, and in 1874 had another attack of varioloid—presenting the phenomenon in the same person of two attacks of vaccination and three of variola, of which two were of the confluent variety.

another twenty with the weakest virus I can obtain, and *none die*. Are the animals thus vaccinated safe from the effect of the more active virus? Yes; but only a certain proportion of their number. Indeed, if I inoculate them with strong virus, six or eight for instance, though sick, will not die, a fact to be weighed in connection with the effect of the first twenty vaccinations, which *all* resulted in death. From the first lot, I then take twenty fresh hens and inoculate them twice, at intervals of seven or eight days. Are they now protected against infection by the stronger virus? To obtain an answer, let us proceed to inoculate with it. This time, the result will vary from that of the second experiment; it will not be six or eight which will survive, but twelve or fifteen. Again, if I take from the first lot of fresh hens twenty others, and vaccinate them successively with attenuated virus, not once alone, but three or four times, the mortality which would have followed the inoculation with very strong virus, (the disease itself), will cease. In this case, it is evident that the animals have been brought to the condition of those which never contract the disease.

A plausible explanation of the non-recidivity referred to may be found in the theory that the microbe (the cause of the disease) finds, in the body of the animal, a congenial medium of culture, and to satisfy the requirements of its own existence, alters or destroys (which, in the present case, are equivalent terms) the elements of its own nutrition, which it either elaborates and appropriates to its own growth, or consumes with the oxygen which it borrows from the blood of the fowl.

When complete immunity is obtained, one may inoculate any of the muscles with the most virulent microbes without producing the slightest effect. In other words, the culture has become impossible in these muscles, inasmuch as they no longer contain the proper food of the microbe.

One cannot express his impressions when observing these phenomena. Here are twenty hens which have never been affected with the disease. I inoculate them in the thigh with the most effective virus, and carefully observe the effects of the inoculation. The next day all are down, very lame, very sleepy; the

inoculated muscle is enormously swollen, lardaceous in its thickness, and filled with the parasites. The mortality commences. One dies, then another, until, in forty-eight hours, all are dead.

Again, twenty others are vaccinated to the *maximum*, inoculated at the same hour as the others, at the same place, with the same virus and the same quantity. The next day, and the day following, all are active and alert; they eat, cluck; the rooster crows; it is the movement and life of perfect health, and the muscles of the thigh present no abnormal appearance. Often, even the mark of the inoculation cannot be seen, and this state of health continues, precisely as if no vaccination had been performed.

But is not this impossibility of culture of the parasite in the muscles confined to those muscles which have received the inoculations of prevention? It becomes, then, important to ascertain what would happen if the deadly virus was introduced either by the circulatory or digestive apparatus. I took ten hens, virgin from any inoculations, and ten others vaccinated to the *maximum*; in all the most virulent lymph was injected in the jugular. The first ten died rapidly, several of them in twenty-four hours. On the contrary, the other ten recovered, without having suffered any appreciable sickness, aside from the results of the incision in the skin and jugular. The blood then was itself *vaccinated*, if it is proper so to express it—that is, the preventative culture had taken from it its materials of culture for the microbe.

And what would be the consequences of the introduction of the disease into the digestive canals? Let us try to produce an epizootic analogous to that which affect poultry-yards, by the food contaminated by the presence of the parasite. On the 11th of March, I put together twelve hens, bought in the market in the morning, with twelve others, previously inoculated to the *maximum*. Every day, I give to those twenty-four hens a meal of diseased muscles from a hen dead by the microbe. The following days the disease and mortality are observed amongst the twelve non-vaccinated birds, distinguished from the others, as those have had a platinum wire run through their combs. On the 26th of March, the experiment is stopped. Seven of the non-vaccinated

hens have died, and a post mortem inspection shows that, without doubt, the disease had infected the organism, either by the anterior digestive organs, or, and oftener, by the intestines, which are generally much inflamed, and sometimes extensively ulcerated, resembling in their lesions those of typhoid fever.* The five other hens, not vaccinated, are diseased; one in the most serious condition.† Of the twelve vaccinated, none died, and all are yet alive and in good health.

We may then present a resumé of the results as follows:

It is the presence of the parasite in the body which produces the disease commonly called *chicken cholera*, and caused the death of the fowl.

From the time when the culture ceases to be possible in the fowl, the disease cannot appear. Hens are then in the constitutional condition of animals which are never affected with the *chicken cholera*. The condition is the same as if they had been vaccinated from birth, the foetal development, which formed the food proper of the microbes, having never been introduced in their bodies, or because these nutritive elements have disappeared in youth.

There is certainly no ground for surprise at discovering constitutions sometimes ready, sometime rebellious to inoculations; that is, to the culture of certain kinds of virus, when, as I have shown in my first note, one may see that the bouillon of yeast, prepared exactly like that of muscles of chickens, remains entirely unfit for the culture of the parasite of the chicken cholera, while it is perfectly good for the culture of a number of other microscopic species, especially the bacteridæ of anthrax.

The explanation resulting from the facts, as well as of the constitutional resistance of certain animals, (as that of the immunity created in hens by prophylactic inoculations), has in it

*The blood is full of microbe, and the internal organs are quite often covered with pus and false membranes, principally by the intestines, through which the microbe seems to have made its entrance.

†It died the 8th of April; another the 23d; three recovered. Altogether, nine died out of twelve. The 8th and 23d of April, the blood of the dead was found to be loaded with the microbe, and the abdomen showed lesions of peritonitis with false membranes.

nothing unnatural, when one considers that every culture generally modifies the medium in which it takes place; for example, the modification of the earth if for ordinary plants; of the plants and animals, if for their parasites; and of our liquids of culture, if for mucedinæ, vibrios or fomentis.

The modifications are manifested and characterized by the circumstances that new cultures of the same species in those media become rapidly difficult or impossible. Let us introduce into a bouillon of chicken, the microbe of cholera, and after three or four days, filtrate from the liquid all signs of the microbe; and again into this filtrated liquid introduce parasites: this last will prove wholly incapable of sustaining the slightest growth. Perfectly limpid after filtration, the liquid will so continue.

Can we then doubt that, by the culture in the chicken of the attenuated virus, the body of the bird is placed in a condition analogous to that of the filtrated liquid, which has been rendered incapable of cultivating the microbe? The comparison can extend still farther, for if the bouillon of culture is filtrated, not the fourth day of the culture, but the second, the filtrated liquid will yet remain good for the cultivation of the microbe, but with less force. Thus one will comprehend that after a culture of the weaker microbe in the body of the hen, the food of the microbe may not have been removed from all the different parts of the body. What remains will allow, then, a new culture, but equally in a limited degree. This is the effect of a first *vaccine*. Subsequent inoculations will by degrees remove all the materials of culture of the parasite. Consequently, by the action of the circulatory system, a moment will come when all new culture will become sterile. It is only then that the recidity becomes impossible, and that the animal is entirely and effectually vaccinated. One might be surprised to see the first culture of the weak virus cease before the nutritive elements of the microbe are consumed. But it must be remembered, that the microbe, ærobic being, is not at all in the body of the animal, in the same condition as in an artificial medium of culture. Here there is no obstacle to its multiplication; in the body, on the contrary, it is continually in conflict with the cells of organs, while they also, as

aërobie beings, are always ready to appropriate the oxygen to their own uses.

Is this, however, the only possible explanation of the phenomena? Rigorously judged, no. One may understand the facts of non-recidivity by supposing that life of the microbe, instead of appropriating or destroying certain elements in the body of the animal, on the contrary, add others to them, which would be for this microbe an obstacle to its further development. The history of the life of inferior beings, and of beings in general, authorizes such a supposition. Excreta born from vital functions may resist a vital function of the same nature. In certain fermentations, one may see antagonistic products take birth during and through the act of fermentation itself, and put an end to the active life of the ferments and to the fermentations a long time before they are complete. In the cultures of our microbe, there might be a formation of products, whose presence would explain, somewhat, the non-recidivity and the vaccinations.

Our artificial culture of the parasite will again allow us to overthrow this supposition. Let us prepare an artificial culture of the microbe, and, after evaporating it to coldness in a vacuum, bring it back to its former bulk by the bouillons of culture. If the extract contains matters poisonous to the life of the microbe, and if such is the cause of the possible non-culture of the filtrated liquid, the new added portion of the medium ought to remain sterile. But in fact, it is not so. We cannot believe that during the life of the parasite, substances may appear likely to resist its further development, an observation which corroborates the opinion to which we were brought upon the causes of the non-recidivity of certain virulent diseases.

In relation to the powers of those extracts of artificial culture of the microbe of the chicken cholera, another question presents itself. We have just demonstrated that these extracts do not contain substances capable of preventing the culture of the microbe. But might they not contain some with which it would be proper to *vaccinate* the chickens? I have prepared a culture of the size of 120 cubic centimeters; filtrated and evaporated to coldness, always with manipulations so conducted as to preserve

its purity. This culture left an extract which was re-dissolved in 2 cubic centimeters of pure water, all of which was afterwards injected under the skin of a fresh hen. Several days after, this bird was inoculated with a very strong virus, took the cholera and died under conditions similar to those of the *non-vaccinated* chickens.

This kind of experiment carries us to an observation as new as it is curious, in its pathological connections :

When one injects under the skin of a fresh hen, in good health, the extract of a filtrated culture of the microbe, corresponding to a very abundant development of the parasite, the hen (after a nervous disorder which passes off in fifteen minutes, and sometimes is only manifested by a slightly hurried respiration and a motion of the beak, which opens and closes several times) assumes the shape of a ball, remains immobile, refuses to eat and has a desire for sleeping, very marked, as in the case of the disease produced by inoculation of the microbe. The only difference consists in the fact that the sleep is lighter than in the real disease, the hen waking up at the slightest noise. This somnolence lasts about four hours, after which the bird returns to perfect health, as if nothing had happened.*

I have several times repeated that experiment, with the same

* Here is the observations of one experiment :

The 4th of March, at 10:30, a fresh hen is inoculated under the skin with the extract of a culture of the microbe of chicken cholera, 120 cubic centimeters in volume. After some moments of hurried breathing, the tongue is agitated in her open beak. After about fifteen minutes, tendency to sleep. The beak is closed, the hen quiet, immobile, nearly gathered into a ball ; her eyes are closed, but open at the slightest noise, only to close again. She sleeps, but easily wakes up, only to fall back to her sleep again.

12 o'clock, M. : Same condition ; refuses to eat ; is very sleepy. She is easily wakened. She has the aspect of diseased hens. Another hen, sick, inoculation the day before, and which will be dead to-morrow, is placed alongside of her. It is difficult to say which is the sickest, though the second sleeps the soundest.

1:30 P. M. : Always sleeping. Head heavy and drooping ; body in a ball ; immobile ; does not eat ; awakes readily.

2 o'clock, P. M. : Same condition. Sometimes raises her head ; opens her eyes as if waking from a dream.

3 o'clock, P. M. : Regains her vivacity ; begins to eat ; carries her head up ; no more sleepiness ; dresses her feathers. It is all over. Nothing else particular to observe. Perfect health. The effect has lasted four hours.

results, and as in each I had been careful to verify that an extract of pure bouillon, where the microbe had not been cultivated, did not give rise to similar manifestations, I am convinced that during the life of the parasite, it produced a state of narcotization or stupefaction which simulates the morbid phenomena so well marked as the sleep in chicken cholera. It is by the performance of its acts of nutrition that the microbe produces the gravity of its disease and brings on death. It is easily understood. The microbe, indeed, is *aërobie*; it absorbs during its life large quantities of oxygen, and consumes many of the elements of its medium of culture, a fact of which one can be easily convinced by comparing the extracts of the bouillon of chicken before and after the culture of the small organism. Everything shows that this oxygen, essential to life, is taken from the blood globules through the blood vessels; and the proof is, that during life, and often also when approaching death, the combs of the sick animals are seen to become bluish, when the microbe is not yet in the blood, or if so, are there in such small quantities that it escapes all microscopical observation. This mode of asphyxia becomes peculiar, then, to the disease, if it cannot be attributed to a circulation rendered difficult by the diseased process itself.

The animal dies, however, from the deep disorders resulting from the culture of the parasite in its body; by the pericarditis and other serous exudations; by the alterations in internal organs; by the asphyxia: but the act of sleeping corresponds to a product born during the life of the microbe, acting upon the nervous centres. The independence of the two effects in the symptoms of the disease, is again established by the circumstance that the extract of a filtrated culture puts to sleep also hens vaccinated to *the maximum*. I will endeavor, however, to isolate the narcotic, and ascertain whether in a certain dose it will not kill, to learn further if, in that case, death will be accompanied with the internal lesions of the disease itself.

These facts will no doubt stimulate further pathological investigations.

Notwithstanding the length of this paper, will the Academy allow me to present briefly a few other peculiarities of the disease under consideration?

As we are aware, it is a terrible and rapidly fatal affection, specially by the direct inoculation of its microbe. It then becomes remarkable that at times it assumes a chronic character; indeed, in some cases, hens are seen which, having been inoculated, after being very sick, do not die, and recover a relative degree of health. Still, they eat little, become ædemic, as proved by the discoloration of their combs; become more and more lean and finally die, after weeks or months of languor. This fact would have been of secondary importance, if in those peculiar circumstances, the microbe was not most generally found in the body at the time of death, proving conclusively that the parasite had been preserved in the animal from the period of the last inoculation, always present and active, though acting quietly and unobtrusively, and surely, though slowly. It destroying its victim, no doubt, remains lodged in some vaccinated region, which becomes unfavorable, by those conditions, to an easy culture. Vaccinated hens principally present this form of disease, which, in truth, however, is not of frequent occurrence. One might suppose that, in these conditions, there would be transformation of virulent into attenuated lymph, but this would be an error. In those cases, the virulency of the microbe is, on the contrary, very great, as can be seen by taking the blood of the hen killed by way of cultures and inoculating it to fresh birds.

Such facts will help us to understand the possibility of those long incubations of virus (that of hydrophobia, for example) which after remaining in the body, in a partially latent state, manifest their presence suddenly, at length, by the most manifest virulency or death.

Will they not also enlighten human pathology? Alas! do we not often see diseases of the order of virulent affections, such as measles, scarlet fever, and typhoid fever, taking on the most serious results, protracted, disastrous, and often incurable? The circumstances I have mentioned are of the same nature, but here we can see their true cause. I conclude by noticing another peculiarity no less interesting to scientific men.

In very well vaccinated and very healthy hens, an abscess sometimes appear, on some parts of the body, full of pus, but

which does not seem to trouble the health of the animal. It is remarkable that the abscess is also due to the microbe of cholera, which is there in a state of preservation, but unable to propagate; no doubt because the hen is vaccinated. It can be separated from the pus of the abscess by culture or by inoculation to fresh hens, which it kills, after developing itself in the ordinary way in the region inoculated. These facts remind us forcibly of the abscess of the Guinea pigs of which I spoke in my last communication, and gave for those a rational explanation. It is very likely that as the muscles of the pigs cultivating the microbe more slowly and with more difficulty than those of hens, the disease limits itself to an abscess accordingly, and recovery becomes possible.

I fear to abuse the patience of the Academy by continuing longer, and feel it my duty to bring my remarks to an end, for the present. The subject is so serious and important, that I will request permission to postpone to future lecture, the *compte rendu* of other observations which I have collected, or may collect. Lavoisier has said, "Nothing would be offered to the public, if one would wait to have reached the end of the field which successively presents itself, and which seems to extend as one advances to investigate it." And again, it will not be without utility for me, if I am enlightened by the judgment of competent men, and thus subjected to a certain control which must confirm and enlarge these researches.

STUDY ON CRIBBING—CAUSES—MEANS OF PREVENTION AND CURE.

BY M. CH. MARTIN.

(Continued from page 97.)

To place the straw, the hay and the oats in a box on the ground, at the feet of a cribber, is a good way to keep him from cribbing, and as simple as it is old, but it has its inconvenience; much of the food is soiled and lost, as the animal refuses then to take it.

I have devised a hay-rack and manger which removes these objections. It is a rectangular box, 1 meter 30 centimeters long, 60 centimeters wide, and 25 degrees high. A hay-rack is the cover, and fixed to it by hinges; its superior border is not above 50 centimeters from the ground of the stable.

When the cribber is taking his food from this hay-rack, he first tries to crib, but having a *point d'appui* too low to allow a muscular contraction sufficient to lower the pharynx, aspiration of the air becomes impossible. Again, when he wishes to eat, to take hold of his food, he is obliged to execute movements of the head *upwards*, and we know that cribbing is possible only with movements *downwards*.

Thus placed, the cribber loses by degrees his bad habit, as the rack is too low, and also because he is obliged to return to the *normal prehension* with movements *upwards*.

This motion is not exactly vertical; most animals perform side-wise, with an ascending curb.

This rack is then made, with the required conditions to (1) prevent, (2) cure, (3) make cribbing impossible.

1. *Prevent*.—All who have raised or observed horses, consider with reason, the horse which licks or bites the manger, as having a pre-disposition to cribbing; this animal attached to the hay-rack in question, may yet lick it, try to gnaw it, but certainly he cannot crib.

(2). *Cure*.—The horse who cribs since some time, either in taking hold of the straw or in resting his head, will, whatever his age may be, lose also this vicious habit, after having for several months fed from this hay-rack.

(3). *Make it impossible*.—The old cribber will try to find a rest, and not finding it, will lose the habit.

XI.

Colts raised in the stable often crib at fifteen and eighteen months. A breeder showed me one which cribbed at eight months, and had begun when but six; he had, after being weaned, been placed in a stable where the manger was arranged for a horse of ordinary size.

Like a bad example, cribbing is contagious, the contagion of imitation. With ordinary mangers and racks, though the ration may be plenty, if for several months young horses are placed alongside an old cribber, three times out of five they will become cribbers also.

Cribbing is not transmitted by heredity; I have seen for about twelve years at the same breeder's, two stallions—a bay normand and a black percheron—both confirmed cribbers. Both had about fifty colts, and none became cribbers. However, cribbing is not a morbid consequence of disposition or of constitution, but only, in most cases, of badly disposed hay-racks or mangers, or of the insufficient size of the alimentary ration.

It is evident to any one who has often and attentively observed horses which begin to crib, especially in eating straw, that this aspiration of air takes place first *unknowingly*; that they are *unconscious* of this act, and *surprised* by the new sensation of the passage and rush of the air in their pharynx.

It is very probable that this sensation is *agreeable*, for they attempt to renew it, so that animals which at first cribbed twice in fifteen minutes, in a few months will do it ten or fifteen times in the same period. When the habit is at this point, if the object upon which the animal takes a *point d'appui* is taken away from him, he will look for another, and will find it. Then cribbing is *a thoughtful act*, and the horse which begins to crib in taking hold of his straw, ends by doing it with hay, with oats, and when his food is all ate, with the manger and the hay-rack. The sensation that the horse has in cribbing must be that of an agreeable coolness, for the temperature of the air which passes slowly to the pharynx during the normal respiration has raised in passing through the nasal cavities, while the air aspired through the mouth has not had sufficient time to become warm. It is a sensation of coolness analogous to the one we have when we suddenly ingurgitate air.

XII.

The cribber which begins in ingurgitating air, soon finishes by swallowing it. It is then only under the influence of this gas

in the stomach and other intestines, that digestive disturbances appear—meteorism, tympanitis, leanness and debility of the subject.

The intensity of this meteorism, its rapid appearance, are the effects, not only of the quantity of swallowed air, but also of the dilatation of this gaseous compound, produced by the elevation of the temperature of the organs into which it is accidentally introduced. The colics caused by cribbing end generally by the expulsion of gas through the anus; sometimes, however, one is obliged to have recourse to puncture of the cæcum, and it is of common observation that old cribbers die always with tympanitis.

It is not my intention to speak here of the different halters, collars, &c., used against cribbing; nor of the different mangers or racks, movable and rotating, which have been recommended, their advantages and objections being already known; and again they generally are but of temporary relief.

Hertwig has sometimes divided the tendons of the two sterno-maxillaris at their insertions, and says that he has cured cribbers by it. Gerlach is said to have cut the subscapulo hyoideus with success. To prevent cribbing, the sterno hyoideus and thyroideus ought to be divided and thus prevent the lowering of the pharynx—I have not yet performed the operation and ask myself if that section would not seriously interfere with pharyngeal deglutition.

EDITORIAL.

STAMPING OUT PLEURO-PNEUMONIA.

It is a little over fifteen months ago that pleuro-pneumonia was officially announced as prevailing to an alarming extent in the United States, and that steps were being taken to check its progress and complete its eradication. Commissions were appointed by several of the Eastern States; laws were passed by the respective Legislatures; funds were granted more or less liberally; State Veterinary Inspectors were set to work, and the whole machine seemed to be set nicely in motion towards securing the

required result,—the stamping out of the disease. There is no doubt that a great deal of this activity originated as a consequence of the attitude assumed by European governments, which resulted in the embargoes on American cattle going abroad; perhaps more so than from the fear of the possibility of the disease spreading further west than it was known to exist. What has been done and what were the prospects of successful results, are already known, and specially for the State of New York, where the well-organized veterinary staff did as good work as could be expected from its officers.

But prospects are sometimes doubtful, and it seems, are to be such, principally in our great country, where political influence has so much to do. Indeed, what has taken place for the last few months? The laws passed fifteen months ago have, in one case, been repealed, the supply of funds has been refused in another, and all the veterinary staffs have been discharged, and the work so well begun, which was so promising of good success, is now in the hands of the State or of the City Boards of Health, in none of which, as far as we know, a veterinarian occupies an official position, for that or any other purpose.

What can now be expected? What results can we look for? Health Boards are generally complaining that their funds are limited, that they cannot employ experts, though they acknowledge their usefulness; and still our wise legislators want them to handle that terrible scourge with the means now at their command.

All who are acquainted with pleuro-pneumonia, with its insidious character, its sometimes obscure manifestations, and the means necessary to check its spreading, will laugh at this last action of our State government, and tremble at the fearful prospects which threaten us, if the disease should reach our western districts; which, we fear, will sooner or later be no more a question of possibility, but a matter of fact.

We, however, as veterinarians, cannot do much but protest. As veterinary surgeons, a magnificent opportunity presented itself, to show the usefulness of our profession, and if failure stares our people in the face, the veterinary profession, at least,

cannot be blamed for the unsuccessful result, whose awful complications will one day follow.

We have yet one hope, and that is, that the Department of Agriculture will continue the work it has already begun, and that, wiser than the State governments, it will take measures which will deliver us from the presence of that terribly dangerous scourge.

BILL TO REGULATE VETERINARY MEDICINE IN NEW YORK STATE.—ITS FAILURE TO PASS.

A bill to regulate the practice of veterinary medicine was introduced, last year, in the Legislature of the State of New York, and, as our readers know, failed to pass. Taken up this year from the pigeon-hole where it had been placed, it was again presented, and again met with the same fate.

Noticing this second failure, the *Medical Record* says, "This could hardly be expected otherwise, as it was a somewhat premature measure. It is well to encourage all proper measures for elevating the standard of veterinary medicine, but the practitioners of this art are not yet, as a rule, sufficiently advanced in education or scientific attainments to need the protection of legislation."

Veterinarians of New York, what can you say to this? The *Medical Record* has told you what it believes to be the truth, and you have no one to blame but yourselves for the allusions made in those few lines. We know that you will deny the allegations made by the *Record*; we know that many amongst us are as advanced in education and scientific attainments as many members of our sister profession, but how have we shown it? When have we placed it on record? Can we point at anything that will reflect advantageously upon us? Can we show any scientific work or investigation of which any of us can be proud? And is it not time that, while attending to the daily labors of ordinary practice, you should do something which would wipe out from the scientific men of your State the sad impression that they have of your scientific qualifications? Let us do this; let us show to the medical profession, at least, that there is amongst us something

else besides the question of pecuniary returns; that we are possessed, as well as medical men generally, of scientific ambition. Let us show it by our work,—work with the pen,—at our meetings, in our Societies, and we are certain that the human physician will be the first to tender us assistance, and help us to obtain that recognition which we desire and deserve, which we will obtain in time, but of which we have not yet shown ourselves worthy.

NOTICE.

As a last notice, we would remind a few of our readers who are three years in arrears for the settlement of their subscription to the REVIEW, that after this number the journal will not be sent to them, unless their dues come forthwith.

BELGIAN VETERINARY CONGRESS.

A national congress of veterinarians is to be held on the 8th of July at Cureghem-les-Bruxelles, to celebrate the fiftieth anniversary of national independence. The congress will last three days, and will be occupied with the discussion of professional subjects. Among the principal questions will be, 1st, Veterinary Deontology; 2d, The Inspection of Alimentary Animal Products; 3d, The Legislation of Redhibitory Vices (Veterinary Jurisprudence); 4th, The Organization of the Civil Veterinary Service.

Invitations have been sent to veterinarians of Europe, and even of America, and we have no doubt this congress will mark an epoch in the annals of veterinary medicine. We regret very much our inability to take advantage of the kind invitation we have received, and wish our Belgian colleagues all the success they may desire,

STAMPING OUT PLEURO-PNEUMONIA IN NEW YORK.

BY JAMES D. HOPKINS, D.V.S.

Inspector on General Patrick's Staff.

The law under which the recent attempt to stamp out contagious pleuro-pneumonia in the State of New York was made, was enacted by the Legislature in 1878, but remained a dead letter until the commercial interests of the country received a blow, through the action of a foreign government, taken in order to save themselves from an invasion of this pestilence. Our government cannot plead ignorance of the insidious enemy in our midst, as they have received repeated warnings from the veterinary profession and press.

An article by Prof. James Law, that was published in the *New York Weekly Tribune*, Nov. 27, 1878, calling attention to the wide spread of this "lung plague" into the States south of New York, and especially into the District of Columbia, was widely copied, both in this country and England.

A cargo of cattle shipped from Portland, Me., on arriving at Liverpool in the January following, was condemned as being affected with contagious pleuro-pneumonia, which led to special inquiries by the English government, who appointed Prof. McEachran, of the Montreal Veterinary College, to investigate.

Prof. McEachran's report that the lung plague existed in Washington, Philadelphia, and Brooklyn, was followed early in February by an order of the British Privy Council that all American cattle should be slaughtered immediately on their arrival at English ports.

On the 6th of February Gov. Robinson commissioned Prof. Law, of Cornell University, to investigate the reports of disease in Kings and Queens Counties, and on the 10th Prof. Law having made his report of the presence, existence and dangerous character of the disease, the Legislature made an appropriation of

\$10,000 to meet instant expenses in carrying out the provisions of Chapter 134 Laws of 1878, for stamping out this pestilence.

The Governor, acting on Prof. Law's report, issued an order to Sheriff Rushmore, of Queens Co., to quarantine the cow stables of Gaff, Fleischmann & Co., at Blissville.

On the 12th of February, Governor Robinson appointed Gen. M. R. Patrick to take charge of the work, and Prof. Law as his veterinary adviser; and on the 13th operations were commenced in Brooklyn. A veterinary staff was organized, and the slaughter of diseased and infected cows began in the Blissville stables, 879 cows, of whom 64 had the disease and were killed on the premises, and sent to the offal dock, and the balance—815—were sent to the butcher.

This prompt action of the State caused much excitement, not only among cattle men, but in the public mind generally, which was fanned by the wild and extravagant reports of newspaper men.

To prevent cattle from Brooklyn and adjoining infected towns being removed to the eastern end of Long Island, hitherto free from disease, Mr. J. Howard Rushmore, Secretary of the Queens Co. Agricultural Society, was placed in charge of the three eastern towns of Hempstead, North Hempstead, and Oyster Bay, and Mr. Benj. Albertson in charge of the three adjoining towns of Jamaica, Flushing and Newtown, with orders to allow no movement of cattle from the western part of the Island toward the east.

On the 31st of March work began in New York, arrangements having been made to inspect all arrivals of store cattle at the Union Stock Yards and steamboat piers. Inspections of the cow sheds of New York and Brooklyn were commenced, as well as in the towns of Kings and Queens Counties. All railroads terminating in the cities of New York and Brooklyn were prohibited from unloading any cattle, except at certain designated places, from which no milch cow, calves, or store cattle could be removed without a permit, showing inspection and bearing the autograph of M. R. Patrick, given by the Inspector detailed for that duty.

Steamboats, barges, and all other means of conveyance were prohibited from receiving on board, or landing cattle within any of the infected counties. All ferries between New York and New Jersey were prohibited from carrying milch cows or store cattle, except by special permit,—arrangements having been perfected between Gen. Patrick and the State Agent of New Jersey, Gen. Wm. H. Sterling, for the inspection and transfer of such family cows as, in the opinion of experts, could be done without danger.

Our work was most heartily endorsed by the Board of Health of each city, and the police were efficient in carrying out the quarantine orders. In New York, the authorities enforced our rules and regulations for controlling the traffic and movements of cattle, as well as the prohibition against pasturing on the commons. In Brooklyn, those in authority released the cows from the pound, and by a resolution of the Board of Aldermen the pound was *abolished*. The police magistrates declined to recognize the law, although instructed by the District Attorney as to its validity and requirements. A resolution of the Board of Aldermen gave permission to the people to graze their cattle on the commons, and the Mayor of Brooklyn, when called upon by Gen. Patrick with copies of the law and the "pasturage order," with a request that he would examine and report upon them, remarked that, as the resolution of the Aldermen was in opposition to the requirements of the *State Law*, it must be inoperative; but, although he did not approve the resolution, he did not veto it, and it became an ordinance. Permits were also given by some of the Aldermen for the moving of cattle upon the streets, in direct opposition to both the letter and the spirit of the law. Notices were served upon them by Gen. Patrick, and actions were commenced before the police magistrates for violation of the State law, but the excitement of a political canvass and coming election seemed to nullify all efforts to obtain decisions, and the work in Brooklyn has been greatly obstructed ever since. The police, under such circumstances, were powerless to render the aid which they had hitherto been prompt to give.

Through the summer months of 1879, the work of inspection of cow sheds and dairy farms of New York and suburbs, and the

destruction of diseased and infected animals, was pushed forward with great energy, additional veterinarians having been added to the staff for that purpose.

The centralization of the business of the cow trade at the Union Stock Yards, in the beginning of July, 1879, and the stringent orders prohibiting dealers keeping cows on sale elsewhere, was the result of tracing outbreaks of disease in cow stables, hitherto free, to the dealers' stable and their pernicious traffic in diseased cows.

Rumors of disease reached our office about May 1st, 1879, of cattle dying in the eastern part of Suffolk county, (Long Island), and Prof. Law at once proceeded to that locality to investigate, and found that a dealer named Billard had bought a lot of calves, (110), some at the Union Stock Yard, New York, but mainly in New Jersey, and taken them to Suffolk county, where he peddled them about among the farmers, mostly of Southampton, Bridgehampton, and Easthampton, in lots of three to fifteen. All the sick animals examined by Prof. Law belonged either to the Billard animals themselves, or to those which had been brought in contact with them.

Chas. S. Rogers, Esq., of Segg, was placed in charge of the towns of Easthampton, Southampton, and Brookhaven, to carry out the provisions of the law under Gen'l Patrick's directions, assisted from time to time by a Veterinary Inspector from the General's staff.

The United States authorities at Washington have issued stringent orders in regard to foreign importations; requiring all cattle from the British Isles to be held in quarantine ninety (90) days, but providing no quarantine ground nor facilities for carrying out the Treasury instructions. Such cattle, under such circumstances, were landed in New York, and, for our own safety, the State authorities were at the expense and trouble of holding them in quarantine at the farm of the importer.

Finding that there was a disposition to take advantage of the facilities given at our office for imported cattle to pass into the interior, *then* to be quarantined, Gen. Patrick notified the Secretary of the Treasury that he would decline hereafter to assume

any responsibility in regard to the quarantine of animals that might come into port, and urged upon him the establishment of a suitable quarantine station, near Sandy Hook, on the unoccupied ground of the United States reservation. In accordance with these suggestions, the Secretary desired the New York Commissioner to examine the reservation on Sandy Hook, to select, if practicable, proper grounds for the establishment of a quarantine; but, at the same time, indicating his opinion that the quarantine should be established and maintained by the State of New York. (Up to this time no further action has been taken).

The number of cattle which had been condemned and slaughtered, in accordance with the law, for which indemnities were given, with the large outlay for professional services, had so reduced the appropriation made by the Legislature, that by the close of August, 1879, it became necessary to largely retrench the expenses, which could only be done by reducing the number of veterinarians, retaining only a sufficient force to hold the ground already gained and continue the inspection of all animals coming to the cities, until such time as the coming Legislature should be able to take the subject into consideration.

The great importance of continuing our restrictions placed upon the importation of cattle from the States south of us, in which the disease is known to exist, will be seen at a glance, as the work we have already done in our own State would be lost were these restrictions removed, inasmuch as the tendency of all cattle trade is toward the city of New York.

On the 9th of September, notice was received by Gen. Patrick of the appearance in Putnam county of some fatal sickness among the cattle, and Prof. Law soon visited certain herds in the town of Patterson, and the existence of contagious pleuro-pneumonia in a virulent form was established.

The fact that the appropriation made by the Legislature at its last session, to carry out the provisions of the laws of 1878-9, was so nearly exhausted as to render it impossible to indemnify the owners of cattle that would be condemned under the law, was made known to the people of Putnam county, who at once called a mass-meeting at Brewsters, October 7th, 1879, to consider the

situation. The main business in Putnam county is the production of milk for the New York market, and the present invasion of a contagious disease among their herds, threatened ruin to a prosperous people, so that when the hour of meeting arrived the representative men of the county were present, and after a discussion of the ways and means of raising the money required to indemnify owners of condemned cattle, a resolution was passed that the Board of Supervisors raise the necessary funds and that the work should be carried forward with energy and dispatch.

Next day the Board of Supervisors had a meeting, and by their official action confirmed the wishes of the people.

Sheriff Doam, of Brewsters, was placed in charge of the work, and with the aid of a Veterinary Inspector from the General's staff the slaughter of the diseased and infected herds was vigorously pushed forward, and the county saved from the threatened invasion.

In the northern and western parts of Westchester county, a number of herds were found infected with the lung plague, all of whom were slaughtered and the buildings disinfected.

Up to May, 1880, only one herd of cattle had been found infected on Staten Island, and by their prompt destruction and the failure to find more after a thorough inspection, the Island was regarded as free of disease. On May 12th, notice of sickness in a herd at Stapleton, S. I., was reported and although the herd was destroyed at once, great anxiety is felt in the vicinity by the owners of cattle, as this infected herd had pastured on the commons with nearly three hundred cows belonging to different owners. Staten Island offers as good a field for the propagation of contagious pleuro-pneumonia as the suburbs of Brooklyn. Here, thousands of acres of commons invite the small dairyman to settle, because of its proximity to New York, and though but little grass can be had, the large number of breweries furnish abundant food of its kind.

The number of cattle that were found sick with the disease up to date, killed and paid for by the State, is 765; and the number examined by our inspectors, 68,746—this does not include the re-inspections.

The number of cattle (infected) killed by the owners, no expense to the State, (except quarantine), 1,460.

Total amount appropriated by the Legislature for this purpose, \$65,000.

The number killed in each county :

Kings.....	92
Queens.....	148
New York.....	149
Suffolk.....	75
Westchester.....	97
Putnam.....	196
Richmond.....	8
	<hr/>
	765

In stamping out contagious pleuro-pneumonia in New York and Brooklyn, both cities were declared under quarantine, and by law it was made a misdemeanor to move a cow on the streets without a permit bearing the autograph of M. R. Patrick, the police being charged with the enforcement of the law.

No fresh milch cows or other store cattle were allowed to enter the infected district, except from known healthy localities ; and for the purpose of having full control of all cattle on arrival, a suitable yard was provided at 59th Street and North River, at which all steamboats, barges, and railroads, carrying store cattle, were compelled to land their stock for inspection and distribution, all cows going direct to the dairies, or from the dairies to the slaughter-house, no dealers being allowed to keep cows on sale elsewhere.

At the same time, an inspection of all cow stables in the infected district was made, and an Inspector made a post mortem examination daily, at the offal dock, of all horned animals gathered by the offal carts.

At the slaughter-houses, an Inspector was in attendance daily, to examine all dairy stock sent there as beef ; and, to encourage the owners of cows in reporting at the office any sickness in their herds, as well as to outbid the dealer, a liberal indemnity was offered. When *sick* cows were found in New York or Brooklyn,

they were promptly slaughtered, and the balance of the herd closely quarantined and fumigated daily with burning sulphur, and the buildings thoroughly disinfected. We have found that this treatment, when properly carried out, checks the spread of the contagion to those animals not yet affected, and is more efficacious than inoculation, for the suppression of the plague. But, if other herds, by this process not being done properly, were endangered, then the whole infected herd were at once sent to the butcher. On farms in the country, where only a fence separates the cattle, immediate slaughter of sick and exposed is the price of safety.

Inoculation was introduced twenty-nine years ago by Dr. Williams, of Belgium, as a prophylactic of this plague, but, after a thorough investigation in Europe, it proved unreliable. Almost all advocates of inoculation deny that an inoculated animal is at all dangerous to others. In this they throw the gravest doubt on the value of the operation as a preservative. The liquids inoculated are the virulent products of the lung plague, and as these do not induce disease of the lungs but only of the tissues where they are inserted, it cannot be supposed that they exert any influence on the economy through any direct action on the normal seat of the disease. If protective at all, it must be by reason of the reproduction of the germs in the blood, or in the seat of inoculation. If in the blood, there must be danger of their being given off by the various free surfaces, and notably by the lungs. Reymal mentions the case of an inoculated cow at the Alfort Veterinary School, which infected two others standing with her. In a stable near Williamsbridge, Joseph Schwab keeps a herd of eighty milch cows, and has practiced inoculation for years, with good results, but last summer Mr. Schwab bought a fine young bull, which he thought he would not inoculate. Ten weeks later the bull died of contagious pleuropneumonia. Again, Mr. W. J. Robinson, of Putnam Co., with a herd of forty head, declares that no sickness had occurred in his herd prior to our visit, but, in the excitement of the outbreak of the lung plague in that county, he had eight cows inoculated. Two died from the inoculation, and a few months after,

he sent his remaining herd to the butcher, where one of the Inspectors found one with the lesions peculiar to this disease, when killed.

Reason and experience agree in showing that the poison may be thus introduced into healthy stables, and therefore *inoculation must be absolutely condemned* whenever a speedy and effectual *stamping out* of the disease is desired. No country has ever succeeded in exterminating this plague by practising inoculation. The most ardent votaries of the practice, Belgium, Holland, Prussia, England, Australia, South Africa, New York, and New Jersey have preserved the plague for decades in spite of the most earnest efforts of this kind.

Let no one delude himself with an idea of similarity to vaccination for small-pox. In the Jennerian vaccination it is a mild, safe disease (cow-pox) that is conveyed, and the vaccinated individual can never become the center for the diffusion of small-pox. But in lung plague it is the virulent matter of the disease itself that is inoculated, and the process would find its counterpart in the inoculation of the infant with genuine small-pox virus. By this a mild small-pox would be produced which the majority of infants would survive, but in the clothing, air and buildings would be scattered the virus of small-pox, that would prove infecting to all susceptible people.

For generations the means of successfully arresting the ravages of this pestilence have engaged the best veterinary talent in Europe, and the results of their observations have been placed on record for the guidance of the profession; and the Legislature of the State of New York, in enacting the law that called the Commission into existence to "*stamp out*" contagious pleuro-pneumonia, did so after mature deliberation and consultation with some of the *best cattle pathologists* in the world. They early recognized that such an extensive country as the United States cannot afford any palliative measures, that will expose forty millions of cattle to this dread scourge; hence the law to *stamp out*.

To stamp out contagious pleuro-pneumonia in a locality where it has existed for years, is no slight undertaking, and opposition may be expected from people whose interests will be interfered

with; but to see the authorities of a city hinder the operation of a State law, and pander to the wishes of their constituents, looking for future suffrages, shows to what depths politicians will descend to secure success.

But regardless of the difficulties that have beset the Commission the work went steadily forward while the money was forthcoming to indemnify the owners of condemned cattle, as the law required; and it is to be regretted, that a short-sighted policy on the part of the authorities, in their failure to provide the required funds, has brought the aggressive work in the stamping out of the disease to a stand-still.

It would have been better never to have expended a single dollar, than to thus ingloriously abandon the field after so much good work has been done, and the fact had been so clearly demonstrated that the undertaking would be successful.

As the Legislature adjourned without making the necessary appropriation for the continuance of the work, Gen. Patrick was compelled, on the 1st of June, to disband the veterinary staff.

We are glad to be able to record the fact that, at the time of disbandment, Putnam, Suffolk and Westchester counties were cleared of contagious pleuro-pneumonia.

New York has two herds under quarantine; Richmond Co., (Staten Island), I have already spoken of; Brooklyn (Kings and Queens counties), has been benefitted and the disease confined to that district between Jamaica and Prospect Park and the East River. Gen. Patrick will keep the quarantine in full force, and with the aid of the New York Board of Health and Metropolitan Police, enforce the law and prevent the re-stocking of our dairies by unscrupulous dealers with diseased cattle from New Jersey and Pennsylvania, until the next meeting of the Legislature.

The veterinary profession will feel gratified to know that the Commission has, in the prosecution of its labors, met with the heartiest good-will and assistance from the medical profession whenever called upon, and we are glad to bear witness to the deep interest taken by many eminent practitioners in their untiring research, as evidenced by their continued attendance at autopsies and inspection of cow sheds.

Gen. Patrick, in accepting the direction of this movement, brought to the work mature experience of contagious diseases of cattle, and in the organization of details exhibited a thorough knowledge of the necessities of the occasion and rights of individuals; and now, at the close of the services of the veterinary staff, instead of reporting only a partial, we should have been able to have reported *complete success*, had the required funds been promptly advanced at the proper time.

The State recognized the claim of the veterinary profession in calling her accomplished son, Prof. James Law, to direct the professional part of the work; and to his ability, faithfulness and large experience in dealing with the disease in Europe, much of the success attained is due.

Also, great credit is due to Prof. Liautard, Dean of the American Veterinary College, who, when a few mercenary veterinary surgeons in the interests of the cattle owners at Blissville denied the contagious character of the malady, by his experience and thorough investigation (including many autopsies) aided the Commission and gave to the public a complete exposé of the attempted imposture.

The veterinarians who have served on Gen. Patrick's staff, feel a just pride at the success they have met with in their difficult work, and deep regret at its abrupt halt.

In writing this report, I have to thank Gen. Patrick and Prof. Law for the use of their report to the Legislature, from which I have largely drawn.

PERSONAL INTELLIGENCE.

Mr. C. P. Lyman, Veterinary Surgeon, attached to the Agricultural Department in Washington, sailed for Europe on the 23d of June, in the Cunard steamer *Abysinia*. A part of the mission of the Doctor is to obtain information regarding the reports which have come from abroad, of the existence of contagious

pleuro-pneumonia in American cattle exported to England, and if possible to trace it back to the place of its origin in the United States.

Dr. Walter H. Hornblower, lately graduate at the American Veterinary College, has received the appointment of Veterinary Surgeon in the 6th Cavalry, United States Army, now in Arizona.

Dr. L. T. Bell, graduate of Veterinary Medicine at the N. Y. College of Veterinary Surgeons, and American Veterinary College, received his degree of M.D. on the 23d of June, from the Long Island College, N. Y.

Prof. A. A. Holcombe, D.V.S., has officially resigned his position of Adjunct Professor of Surgery in the American Veterinary College.

PROSPERO.

THE HISTORY OF HIS DISEASED CONDITION WHEN VISITED ON
THE 6TH OF JUNE, 1880.

BY A. LIAUTARD.

The interest attached to this valuable horse, the various reports of his death, (afterwards contradicted), and the erroneous accounts of his sickness, make it obligatory for me to offer to the profession a statement of what I know of his previous history, and of the condition in which I found him on the day of my visit.

Like great men, great horses are objects of universal interest, and like them also, their published obitnaries do not generally anticipate their death. But, as with but few men, Prospero has enjoyed the distinction of an obituary notice while yet alive.

Some time in May, I received from Dr. Miller, of Camden, a letter informing me that Prospero was sick; that his trouble was

supposed to be purulent collection of the sinusses, and asking for advice as to the manner in which the operation of trephining ought to be performed; that a tooth had been pulled out already by a veterinary dentist; that this proved to be healthy; that the owner was not aware of this fact; that Mr. Parks was to call on me; that I was not to tell him about it; and that an early reply would be appreciated, as it was an interesting case, and Dr. Miller was anxious that the other veterinarians of Philadelphia should not have a chance to treat him.

Thinking that the first duty in the matter was to inform Mr. Parks of the extraction of the healthy tooth, before attempting any further treatment, and that Dr. Miller or the owner would call on me, the letter was put aside and left unanswered.

About the 2d of June I was called upon by Mr. Parks, and learned from him what he supposed to be the condition of the suffering animal: being the first intimation I had received, that such an operation had been performed. He asked me to see the horse and report his condition, with a view to his immediate destruction if I considered him beyond cure.

Accordingly, on the 6th of June I went to Philadelphia, and was kindly met at the depot by Dr. Miller, who drove me to the stable where Prospero was kept.

The day following my visit, I reported to Mr. Parks, who was absent from his office, and for whom I left *a letter* with a statement of my diagnosis and advising him to have the horse put out of his misery. Subsequently an order was received from him to destroy the poor animal, with directions to have his body, or such portions of it as might be of interest to the examiner, sent to the American Veterinary College.

Obituary notices were forthwith published in the daily papers in New York; the history of his life appeared in *Turf, Field and Farm*, and the report was widely circulated that Prospero had been killed, being affected with big head, or osteo porosis. This was followed by another report, in which it was said that an error of diagnosis had been made; that the animal had only carious teeth, which had been operated upon, and that, I supposed, he would recover, as otherwise what would have been the use of

this last operation, which consisted in the removal of three molars, two of which were much diseased.

I received a few days ago a letter from Dr. Gadsden, of Philadelphia, telling of his surprise at my diagnosis of big head—an erroneous impression which he received from Dr. Miller and the reports in *Turf, Field and Farm*.

On the day of my visit, the animal presented the following conditions: Prospero was in a box stall, as comfortable as possible; his face, on the right side, presented a large swelling, somewhat diffused, yielding to pressure, involving the superior maxillary bone, extending upwards to the lacrymal and zygomatic. The skin showed large veins running underneath and had two openings where the trephining was performed, from which a bloody, serious and very offensive discharge was running. The finger, introduced through the wound by Dr. Miller, penetrated into the sinuses, and when withdrawn was loaded with the peculiar odor so characteristic of necrosed bone. On examination of the mouth with a speculum, a large fungoid granulation was visible, protruding between the molars at the place of the extracted tooth. The posterior molars were diseased. The palatine plate of the maxillary and the alveolar cavities were more or less exposed, and the fingers which touched them carried with them the peculiar odor already mentioned. There was a discharge from the right nostril, of the same character as that of the wounds of the face. Dr. Miller had told me of his operation; quite a severe hemorrhage had accompanied it, and if my memory serves me, stated that from the moment he opened the sinuses he thought he had something more than a secretion of pus in those cavities.

In the presence of these symptoms, I made a diagnosis of osteo sarcomatous degeneration of the face, brought on by carious teeth, and probably stimulated by the improper extraction of the healthy molar. I made my diagnosis known to Dr. Miller, who stated that he thought so from the moment he had operated, as he had felt it to be like what he had commonly met with in cows. I repeated this diagnosis to Dr. Zuill, whom we met as I was returning to the railroad depot. I also stated it to the students of the American Veterinary College, on my return to New York,

and I wrote it to Mr. Parks, who I understand has my letter yet in his possession.*

How, in the presence of these facts, was the "big head report" accepted, even by professional men, who ought to have known better? I cannot explain it, unless for some who consider osteo sarcoma and osteo porosis to be the same disease.

The prognosis which I made was a serious one; yes, a fatal one, and time alone will show if I was too hasty in making it.

Here was an animal worth a large sum of money, as a trotting horse; as an ordinary horse, comparatively almost nothing. I weighed carefully his chances of recovery to usefulness, and have by experience learned that he had almost none.

The indications were to remove the diseased teeth and to remove also, if possible, the diseased bones of the face. This done, what would be the prospect? Would those alveolar cavities close up entirely? Was there not danger of food accumulating in the sinuses—and what then? I have had cases which have shown me the incurability of such lesions. But let us suppose that the cavities would have closed; what about the other lower grinders? Were they not likely to become at least a source of annoyance and of suffering to the horse? Would they not always require watching as to their abnormal growth and possible injury of the tissues above them? And what a life of misery, of starvation perhaps, for this noble brute, who had given so much pleasure to his owner! Was he thus to be rewarded, and for the sake of a few months of existence, be allowed to suffer for the remainder of his days? I thought not; I think so still. And as I stated before, time alone will show me that I was wrong, if by a wonderful recovery, by a natural work of repair the different and fatal results that I have already met in my own practice are to fail in their lessons.

*Since this writing, I understand the letter has been mislaid.

EXTRACTS FROM FOREIGN JOURNALS.

SURGICAL TREATMENT OF A TENDINOUS WIND-GALL.

Mr. Vanderwah having a tendinous wind-gall of the near hind leg to treat, used first a cantharidis blister, without satisfaction; he then tried the red iodine of mercury ointment, and failed again; and then employed aspiration with the instrument of Dicalafoy.

Thirty grammes of synovia being removed, fifteen grammes of tincture of iodine were injected into the serous sac, and after five minutes were almost entirely drawn off (12 grammes).

The next day, high reactive fever; the temperature had raised 2 degrees; the seat of the operation was highly inflamed, much swollen and very painful.

These symptoms soon subsided, but the swelling remained for some time. A month later the lameness had entirely disappeared. Seven months after, the wind-gall was entirely removed.—*Iydschrift*.

RESPONSIBILITY AND TRICHINOSIS.

Mr. Heilemann, veterinarian of Berlin, found in the inspection of meat, some containing trichinæ. He took advantage of his discovery to give some of it mixed with healthy meat to a cat (very annoying to his wife). Eight days after the poor cat was very sick, and a couple of weeks later died. At the post-mortem only a few trichinæ were found in the muscles of the feline.

In relating this fact, Dr. Wekenkel wisely says: In performing this experiment, did Mr. Heilemann fully realize the possible consequences of his action? Did he lose sight of the fact that in trichinizing the cat, without submitting him to a special watch, he created the possibility of new infections, of which it may be difficult to see the possible sequelæ. For us, similar acts are unwarranted, and ought not to be allowed.—*Annales de Bruxelles*.

THE INFLUENCE OF FOOD UPON THE RECEPTIVITY OF RATS TO
THE VIRUS OF ANTHRAX.

Mr. Feser had remarked that white rats, which he kept for experiments, remain, at certain times, refractory to the inoculation of charbon, no matter how active; while at others they would take it very readily. Mr. Feser cannot explain this except by the change of food—vegetable first and then animal—to which they were submitted.

During several weeks, some rats were exclusively fed with meat, and again some with bread only. These last all died after an inoculation of anthrax, while the former resisted unless they received a large quantity of virus.

A series of close observations was then started, in dividing the rats into groups and feeding them exclusively with such and such food. Inoculation made on the animals fed with meat entirely remained sterile; still, in injecting afterwards those rats with a large quantity (half a cubic centimeter) of strong virus from the blood of the heart of a cow, all died; the inoculation of three or four drops of the same blood was without results on rats, while it killed rapidly other animals, rabbits for instance. More than that, these rats fed with meat and resisting the virus, were then fed with vegetables, and six weeks later one drop only of carbuncular blood killed them in thirty-six hours.

It then seems to result from the above, that the nature of food has a great influence upon the disposition for contracting anthrax.
—*Annales de Belgique*.

TRICHINA ON BOARD THE "CORNWALL."

§ A so-called epidemic of typhoid fever broke out some time ago on board the Cornwall. Several persons on board died. Dr. Power having made post-mortem of one of them, found that instead of an epidemic of typhoid fever, it was one of trichinosis, probably due to the eating of American pork.—*Revue d'Hygiene*.

CONTAGIOUS DISEASES IN PRUSSIA.

Anthrax—Was less frequent than last year. The losses have been 28 horses, 1,009 bovines, 654 sheep, and 171 swine. The number of affected districts was smaller also. The disease was most common toward the end of summer and in the fall of the year. Silesia furnished a quarter and Pomerania one fifth of the losses, which in some places broke out amongst deers and boars.

The cases were more numerous in some of the places where it had existed before, and it seemed demonstrated that certain fields had become true centers of infection because of infected cadavers buried there. The cases of transmission by inoculation were rare.

Twenty-five persons were infected and three died.

2d. *Foot and Mouth Disease*.—Comparatively to past year, this is less common. It was not found in more than 657 herds—most of them were in Silesia, Brandenburg, and Saxony.

Inoculated animals had a mild affection with a short duration.

No bad effect of the use of the milk was observed.

3d. *Contagious Pleuro-Pneumonia*—Has spread some, and affected more animals. 2,090 animals were recognized as diseased; of these 86 died, 1,778 were destroyed by order of the authorities, and 234 at the request of the owners. 76 per cent. of the diseased animals belonged to Saxony, Brandenburg, Pomerania and Hesse-Nassau districts. The results of inoculation were not positive.

4th. *Glanders and Farcy*.—The number of animals thus affected has been 2,073. Among those 122 died, 1,745 were destroyed by the authorities, 127 by request.

5th. *Small Pox*—Has been more frequent—out of 1,210 herds, preventive inoculation was practised—16,369 sheep died of this disease.

Statistics have proved that preventive inoculation is most often the cause of the different invasions of the disease, and that it is only in the districts where it is performed that the disease is stationary enzootic.

Preventive inoculation is not so extensively put in practice.

6th. *Maladia du Coit*—1,129 animals have been affected.

7th. *Scabies*.—Only 790 cases were observed.

8th. *Hydrophobia*.—Cases of these affections are less frequent in dogs and bovines, but more so in horses and in sheep. 474 dogs, 43 bovines, and 49 of each of the others died from the disease.—*Annales de Belzique*.

DISCOVERY OF VACCINE HORSE-POX.

The 5th of May, Mr. Alexander showed to Mr. LeBlanc a case of spontaneous *horse-pox* among the horses of Mr. Marx, on a well-bred horse from Germany. The vaccinal lymph was inoculated by M. Chambon upon a heifer three months old, by three punctures on the udder. These developed normally, and with their lymph another was successfully vaccinated on the 13th. The 19th, she exhibited a handsome vaccinal eruption, (60 postules). With the lymph of those, two heifers were also inoculated, and by them the service of vaccination of the society d'Hygiene will be well provided.—*Gazette Medicale*.

STERILITY DUE TO THE OBLITERATION OF THE OS UTERI IN A COW.

Twenty-six months old, she takes the bull, but remains sterile. When first seen by the author of the report, she had all the signs of health, in good condition, hair silky, nose cool; she was lively, had no nymphonia, became in heat every five or six weeks—this lasted two or three days. The empirics attribute this condition to a wart, and the clitoris had been cauterized with actual cantery brought to white heat.

On examination of the vagina, the hand being first well oiled, the os uteri felt of the normal size, but gave the sensation of a hard, somewhat fibrous cord; it was inextensible, and the entrance to the uterus was tightly closed. It took more than half an hour of manipulation before the end of the index finger could be introduced. The attempt to fecundate was always followed by failure. The cow was ultimately killed.—*Journal de Lyons*.

OBSTACLE TO PARTURITION BY OCCLUSION OF THE OS UTERI.

A cow was in labor for forty hours. When seen, she was standing up, the hind legs apart, the hocks flexed, the vertebral columns bend upwards; the animal was making continued efforts. A large, red tumor, bosselated, situated in the place of the vulva, was hanging down to the hocks; through its walls the head and legs of the foetus were easily made out. The covering of this mass was the mucous membrane of the vagina, continued with the skin of the perineum and of the gluteal region. The opening of the vulva entirely disappeared and the neck of the uterus, situated at the lower part of the hernial sac, was but a small depression, scarcely half a centimeter deep. The walls of the neck, closely together, are so adherent that it is impossible to introduce either the finger or a small instrument to operate the dilatation. Everything has returned to its normal position, and the entire occlusion of the neck becomes more manifest.

With an ordinary bistoury a way was made for a blunt instrument, with which three incisions were made, two superior—one to the left and the other to the right—and the third to the lower part. As these were made, the opening dilated and the head of the calf was soon engaged in the pelvic strait and ready to come out. The success was perfect—calf and cow got well.—*Journal de Lyons.*

SALIVARY CALCULUS IN A FEMALE ASS.

A female ass, bought in 1875, had at that time a small tumor on the inferior part of the left cheek. This tumor kept on growing up to October, 1879, when it interfered with mastication; the animal refusing all food. She was in good condition, fat, and nursed a little foal four months old.

At the lower part of the left cheek she presented a somewhat round tumor, well prominent, about seven centimeters back of the commissure of the lips, and ten centimeters from the eye. Its contour, regularly circular forward and downward, was straight behind and followed parallelly the posterior border of the inferior maxillary. Above it was limited by the anterior border

of the masseter muscle. The tumor extended in the direction of the inferior border of the masseter in a conical shape, and ended a little posterior to the maxillary fissure. At its base it measured eleven centimeters, and its thickness was about from nine to ten centimeters. The skin was intact; there was no fistulous tract. The tumor was not painful, hard forward and soft behind. An explorative puncture met with a hard and resisting body, and allowed the flow of foetid brownish fluid. Examination of the mouth revealed a round tumor due to the pushing inward of the mucous membrane, which was not excoriated. All the other functions were normal. The tumor was the cause of the loss of appetite. After careful consideration, a diagnosis of salivary calculi was made, and the treatment decided. This consisted in the removal of the foreign body. The tumor was found to contain a large salivary calculus and several little ones. The large one weighed 532 grammes (over a pound); one small one weighed one gramme. When first removed the large one had a very foetid odor, analogous to that of the saliva which flowed at the time of exploration. Its weight diminished little by little, and after forty-eight days it had lost forty-one grammes in weight. The only complication which followed the operation was the closing up of the duct of Stenon in the mouth, which was overcome by an artificial opening made by a fine cauterization of the buccal mucous membrane. The recovery was perfect.—*Journal de Lyons*.

CONTRACTION OF THE PYLORIC ORIFICE IN BOVINE.

1st Case.—A cow has been sick for about eight days; she lays down, her head and legs stretched out; she is very weak, rises up with difficulty, temperature of the body little below normal, nose dry and rough, abdomen hard and tympanitic. Auscultations and explorations of the abdomen show a complete inertia of the digestive canal. Has had no faecal passages for two days; the last digestion were very dry. Rumination has stopped, pulse counts 70, internal temperature 40° C.

A diagnosis of gastro enteritis is made, and the animal is condemned to be destroyed. This done, after a few unsuccessful at-

tempts to treatment, the following lesions were found at the post mortem. All the gastric cavities are distended with a soft and even liquid mass; the mucous membrane is slightly injected; the intestine is empty and contains a glairey yellowish fluid. On closer examination the pylorus is found so contracted that a small pencil can scarcely pass through it. The contraction extends about five centimeters in length. This part is hard, difficult to divide with the knife, and has the aspect of a cartilaginous mass. The intestinal wall at that part measures seven millimeters in thickness; the mucous membrane is normal.

2d Case.—Another cow presented analogous symptoms and though condemned from the first visit of the attendant, received some treatment and died the 12th day. The post mortem revealed similar lesions to the first case.

The author Klopferstein concludes that these conditions are more common than they have been reported, but escaped the post mortem examination.—*Archives für Thierheilkunde.*

TUBERCULOSIS FROM THE USE OF MILK OF TUBERCULOUS COWS.

BY PROF. BOLLINGER.

The transmission of tuberculosis by inoculation has been observed by Villimire, Chauveau, Bollinger, &c., and denied by Ruklinghausen. The question of transmission by the use of raw milk is yet more doubted.

If bovine and human tuberculosis are not identical, they however have many points of resemblance.

In 1878, Bollinger gave to three pigs during five weeks, raw milk taken from a cow suffering with chronic pulmonary phthisis; all three remained healthy. In 1879, Bollinger continued his experiments with the milk of a cow which did not seem to be in advanced tuberculous condition. Four young pigs, two and a half months old, were fed with it. After two and a half months they were killed and showed miliary tuberculosis of the liver and kidneys, with pulmonary tubercular lesions—lymphatic glands were in caseous condition. The mother of the pigs was killed

and found healthy. A fifth pig fed for fifteen days with the same milk died also of tuberculosis.

Out of a lot of six other pigs, two received cooked milk, two raw milk, and two were kept as means of comparison. At the autopsy, the first two proved tuberculous, the second showed intestinal inflammation; the glands of the neck and of the abdomen in a caseous condition. In the other two the glands were healthy.

Two other experiments made on monkeys, one on a goat, and one on a guinea-pig, were negative.

According to Bollinger, the milk of tuberculous cows, given for a long time as food, must always produce miliary tuberculosis and tuberculous degenerations. However, one must admit that the danger of the transmission is not as great as generally believed. If it were otherwise, the disease would be more common in swine, while it is exceptional to meet it, though those animals are often fed with the milk of phthisical cows.—*Wochenschrift für Thierheilkunde*.

(We would be thankful to Dr. Peabody, of Providence, for a report of his observation of tuberculous meningitis in a child fed with the milk of a phthisical cow, which was placed under his care.—ED.)

EXCHANGES, ETC., RECEIVED.

EXCHANGES—Revue d'Hygiene, Revue Dosimetrique, Clinica Veterinaria, Veterinary Journal, Veterinarian, Recueil de Medecine Veterinaire, Archives Veterinaires, Annales de Belgique, Gazette Medical, Revue für Thierheilkunde und Thierzucht, Scientific American, Prairie Farmer, American Agriculturist, Turf, Field and Farm, Country Gentleman, National Live Stock Journal, Medical and Surgical Reporter, Iowa Farmer.

PAMPHLETS.—Betail de l'Amerique du Nord, by E. Dele.

JOURNALS.—Philadelphia Record, American Cultivator.

AMERICAN VETERINARY REVIEW,

AUGUST, 1880.

ORIGINAL ARTICLES.

THE CONNECTION OF THE GERM THEORY WITH THE ETIOLOGY OF SOME COMMON DISEASES.

BY M. L. PASTEUR.

When I found myself engaged in the studies which I am at present prosecuting, I was endeavoring to extend the germ theory to certain common affections. When shall I be able to terminate these researches? With the desire to see them completed by others, whose activity they may stimulate, I take the liberty of presenting them so far as I have advanced in them.

SECTION I.—UPON FURUNCLES.

In May, 1879, a person working in my laboratory had numerous furuncles, appearing at short intervals, sometimes affecting one part of the body, sometimes another.

Keeping always in view the fact of the immense activity of microscopic beings in nature, the question presented itself to my mind, whether the pus of furuncles did not contain one of those organisms whose presence, development and transmission to various points in the economy, might not stimulate the local inflam-

mation, the formation of pus, and explain the recidivity of the disease for a time variable in length. It was easy to put the idea to the proof of observation.

First Observation.—On the 2d of June, a puncture was made at the base of a small cone of pus, crowding one of the furuncles, situated at the back of the neck. The liquid obtained was sowed to the contact of air, every precaution being taken to exclude foreign germs, either at the time of the puncture, and of the sowing of the liquid of culture, as well as during its continuance in the oven, whose temperature remained constantly at about 35°.

The next day, the liquid of culture had lost its clearness and contained a special organism, formed of little spherieal points, grouped by couples of two grains, seldom of four, but often gathered in little masses.

During these experiments, two liquids were selected for use; the bouillon of muscle of chicken, and that of yeast, and the result varied somewhat as one or the other was employed. These variations demand notice. With the yeast, the couples of small grains are spread in all the parts of the liquid, which is uniformly cloudy. With the bouillon of chicken they are gathered in small masses, lining the walls of the vase, and the liquid remains clear, unless it is shaken; in this case it becomes cloudy by the breaking up the little masses spread upon the bottom of the vases.

Second Observation.—June 10th, another furuncle appeared upon the right thigh of the same person. Pus was not yet visible under the skin, but a prominence, red in color, appeared on the snrface, of about the dimensions of a twenty-cent coin. The part was carefully washed with an alcoholic mixture, which was dried up with blotting paper which had been exposed to the flame of an alcoholic lamp. A small punecture made on the prominent part produced the collection of some lymph, mixed with blood, which was sowed simultaneously with some blood taken from one of the fingers. The following days the blood of the finger remained sterile, the other, on the contrary, exhibited an abundant culture of the same organism that was formed in the first observation.

Third Observation.—On the 14th of June, another furuncle

appeared on the neck of the same person. The same examination produced the same result, to wit: the development of the already-mentioned microbe; and there was, as before, sterility of the blood obtained from the general circulation, which this time, however, was taken from a point at the base of the furuncle, around the inflamed part.

While making those observations, I had spoken of them to Dr. M. Raynaud, and that gentleman kindly sent me a patient who had had furuncles for the last three months, in order to enable me to still further extend the investigation. On the 13th of June, I tried the culture of the pus of one of the furuncles of this patient. On the next day a general cloudiness of the liquid of culture appeared, still accompanied by the same unique parasite.

Fourth Observation.—June 14th, the same patient showed me an enormous furuncle, forming in the left axilla. The prominence was well marked, together with the redness of the skin, but no pus had yet appeared. An incision of the skin on the top of the prominence, however, gave exit to some pus, mixed with blood, showing an easy culture in twenty-four hours and the re-appearance of the same organism. Blood taken from the arm, at a distance from the furuncle, remained sterile. June 17th another furuncle appeared in the same individual, giving similar results, viz: the development of the same organism in the pure state.

Fifth Observation.—On the 21st of July, Dr. M. Raynaud informed me of a woman having multiple furuncles; indeed, her back was covered with them, some suppurating, others ulcerated. Pus was obtained from those which were not open, and after several hours the sowing of the pus gave an abundant growth, invariably the same organism, always pure without mixture with any other, while the blood taken at the inflamed base of the furuncle still remained sterile.

To resume, it thus seems certain that all furuncles contain an ærobie, microscopical parasite, and that to this are due the local inflammation and the formation of the pus, its legitimate result.

The liquids of culture of the little organism, inoculated under the skin of rabbits and cobayes, give rise to abscesses, gener-

ally small and rapidly healing. As long as recovery is not complete, pus from these abscesses will always show the microscopic organism. It is then there living, acquiring its growth, but its propagation at a distance does not take place. The cultures already mentioned injected in small quantities in the jugular of guinea pigs, have shown that the little organism in question does not grow in the blood, as the day after the injection it cannot be found even by the means of cultures. In a general way, I will observe that aerobic parasites do not easily cultivate in the blood so long as the blood corpuscles are in a good physiological condition. I have surmised that this circumstance may be explained as a kind of a struggle between the affinity for the oxygen of the blood globules and that which is proper to the parasite in its cultures. As long as the blood corpuscles are the stronger, that is, when they take up all the oxygen, the vitality and propagation of the parasite become very difficult, if not impossible. It is then easily eliminated, or, so to speak, digested. I have often witnessed these facts in carbuncular infections, and even in that of the chicken cholera, diseases which are due to the presence of an aerobic parasite.

The culture of the blood from the general circulation in the preceding experiments being always found sterile, it would seem that in the state of furuncular diathesis the small organism does not exist in the blood. That it does not grow, for the reason I have just given, and that it is not abundant in it are all matters of evidence, but we must not conclude absolutely from the sterility of the cultures I have referred to, that the little parasite is not, probably at one time or another carried by the blood and transported from a furuncle in the way of formation, to another part of the body, where it can lodge, grow, and give rise to another furuncle. I am satisfied that if in the furuncular diathesis we could place in culture, not a small drop from the general circulation, but several grammes or more, we should often succeed in obtaining an abundant growth. In the numerous experiments I have made upon the blood of chicken cholera, I have repeatedly obtained proof that at the period when the small parasites of that disease began to rest in the blood, repeated cultures of drops

of that blood, taken even in a single organ, the heart for instance, did not prove equally fecund; this is easily conceded. On one occasion it occurred that out of ten fresh hens, inoculated with infectious blood, which had begun to contain the microbe, three died, and seven did not show any signs of being affected. The microbe, indeed, at the time when it began to penetrate the blood, may exist by unity in some small drops, and not at all in others, surrounding. It would then, I conceive, be of great utility to discover a case of furuncular diathesis, in a patient who would allow himself to be pricked in several parts of the body, remote from furuncles already formed, or in way of formation, in order to prepare numerous cultures, simultaneous or otherwise, from the general circulation. I am certain that successful cultures of the small organism of furuncles would be more or less frequently discovered.

SECTION II.—UPON OSTEOMYELITIS.

For this disease I have only one observation to record, which I owe to the kindness of Dr. Lannelongue. The valuable paper published by him on this disease is already well known, as well as the possibility of its curability by trepanation of the bone, followed by antiseptic washes and dressings. At his request, on the 14th of February, 1880, I visited St. Eugeny hospital, where an operation was about to be performed on a little girl twelve years of age. A large swelling involved the right knee, from the middle of the thigh to a point below the calf of the limb; there was no communication with the surface. The child being chloroformed, a long incision was made below the knee, from which pus escaped freely, the tibia being exposed and denuded to a great extent. The bone was trephined in three places, through each of which the pus flowed in abundance. The pus of the outside and of the inside of the bone was carefully collected, to be afterwards examined and cultivated. The direct microscopic examination of both portions was most interesting. It was evident that they contained in great quantity an organism similar to that of the furuncles by couples of two or four grains, and by masses of these, some with well defined outlines, others less marked, and with

pale conturns. The external pus presented pus corpuscles in abundance, while the internal had none. It was like a greasy paste of furuncular organism. And it is a remarkable fact that in less than six hours afterwards, the sowing of the liquids of culture was followed by the development of the small organism. I saw then that it was exactly that of the furuncles. The diameter of the grains was found to be one thousandth of a millimeter. If I would dare so to express it, I would say that, in this case at least, the osteomyelitis was a furuncle of the marrow of the bone. It would be easy, no doubt, to develop artificially osteomyelitis upon living animals.

SECTION III.—UPON PUERPURAL FEVER.

First Observation.—March 12th, 1878, Dr. Hervieux had the kindness to receive me in his service at the Maternity, to visit a woman, delivered within a few days, and who was affected with a serious puerpural fever. The discharges were most fetid. I found them full of microscopic organisms of various kinds. From a puncture on the index finger of the left hand, which had been carefully washed and wiped with a *flambé* (scorched) cloth, some blood was collected and sowed in bouillon of muscle of chickens. The following day the culture remained sterile.

On the 13th another collection of blood was obtained from a puncture of the finger. This time it proved fecund. Death having taken place on the 16th, at 6 A. M., it was shown that the blood contained a cultivable microscopic parasite, three days at least before death.

On the 15th of March, eighteen hours before death, blood was taken from the left foot, and its culture proved to be fecund.

The first culture of the 13th contained only the organism of the furuncles; the culture of the 15th contained one somewhat similar to that of the furuncles, but presenting differences easily to be distinguished. Indeed, while the parasite of the furuncles is by couples, or were rarely gathered in little masses of three or four grains, that of the culture of the 15th was in long chapelets, with a variable number of grains. These chapelets were flexible and intermixed together.

The post-mortem took place on the 17th, at 2 P. M. There was an abundant collection of pus in the peritoneum. This was sown with the greatest care, and blood obtained from the basilic and femoral veins was also sown. The pus from the surface of the mucous of the uterus, that of the fallopian tubes, and even that of a lymphatic from the uterine walls was also sown. The result of the cultures was as follows: in all there were long chapelets, as above described, without other organisms, except in the culture of the pus from the peritoneum, which also showed the small pyogenic vibrio, which I have named the organism of pus in the paper I published in April, 1878.

Interpretation of the Disease and of the Death.—After delivery, the pus which naturally forms in the wounded parts of the uterus, instead of remaining pure, became mixed with microscopic organisms from outside, especially with that in long chapelets of grains and with the pyogenic vibrio. These had passed into the peritoneum through the fallopian tubes, and some of them into the blood, probably by the lymphatics. Absorption of the pus, always very easy and rapid when pure, became impossible from the presence of the parasites, whose existence ought to have been prevented from the time of the delivery.

Second Observation.—On the 14th of March, at Lariboisiere, a woman died of puerperal fever. The abdomen had become very tympanic before death. By a puncture of the peritoneum, pus was removed in abundance and sown, as well as blood from a vein in the arm. The culture of the pus gave the long chapelets and the pyogenic small vibrio. The culture of the blood gave only pure long chapelets.

Third Observation.—May 17th, 1879, a woman delivered three days previous, was sick, as well as the child she was nursing. The lochia was full of pyogenic vibrio, and of the organism of the furuncles; the latter, however, in small proportion. The milk and the lochia being sown, the milk gave the organism in long chapelets, but the lochia only that of pus. The mother died. There was no autopsy.

On the 28th of May, a rabbit was inoculated under the abdomen with five drops of the preceding culture of the pyogenic

vibrio. The following days a large abscess was formed, which ulcerated on the 4th of June. The pus from it was abundant and caseous. A diffused hardness surrounded the abscess. June 8th, the opening of the abscess was large and the suppuration abundant. Another abscess communicating with the first was forming on the borders. During the whole month of June the rabbit was sick, and the abscesses continued to suppurate, but in diminishing degree. In July, they were closed and the rabbit was cured. The nodosities under the abdomen were gone.

How many disorders in a woman recently delivered may follow the introduction of a pyogenic organism, when by the lesion of the maternal placenta it has been able to penetrate into the peritoneum, in the lymphatics or in the blood! Its presence is much more dangerous than that of the parasitic chapelets. Let us add, that its development is always threatening; for, as I stated in 1878, it can be found in many common waters.

I add, that the organism in long chapelets of grains is not less common than that of its location on the surface of the mucous membranes of the genital parts. There is then no puerpural parasite, properly so called. I have not met with the true septicemia, but it must be amongst puerpural affections.

Fourth Observation.—On the 14th of June, at Lariboisiere, a woman who had been very sick, after recent confinement, died at 12 P. M. A few hours after death, pus from an abscess on the arm, and blood from one of the fingers, were collected and sown. On the 15th the culture of the pus was full of long chapelets of grains. That of the blood remained sterile. Autopsy took place on the 16th, at 10 A. M. The blood of a vein of the arm was sown, as well as the pus taken on the walls of the uterus and that of a collection in the synovial membrane of the knee. All the cultures were fecund, even that of the blood; and all showed the long chapelets of grains. The peritoneum contained no pus.

Interpretation of the Disease and of Death.—The wound of the uterus after delivery had, as usual, furnished pus which gave refuge to the germs of the long chapelets of grains. These, probably by the lymphatics, had passed into the articulations, and

a little all over, giving rise to metastatic abscesses, which became causes of death.

Fifth Observation.—On the 17th of June I received some blood, obtained with great care, from a child who had died soon after birth, and whose mother had had, before confinement, chills and other febrile symptoms. This blood, when cultivated, furnished the pyogenic vibrio in abundance. On the contrary, blood taken from the mother on the 18th, in the morning, (she had died at 1 A. M. during the night of that day), gave rise to no organic development, either on the 19th or the following days. The autopsy of the mother took place on the 19th. The fact is worthy of notice, that neither the uterus, the peritoneum, nor the intestines presented any peculiar appearance; but the liver was filled with metastatic abscesses. Where the hepatic vein emerges, there was pus in the vein, and the walls of the liver at that point were ulcerated. The pus of the abscesses of the organ was full of pyogenic vibrios. The substance of the liver itself, taken outside of the visible abscesses, gave cultures full of the same organism.

Interpretation of the Disease and of the Death.—The pyogenic vibrio formed in the uterus, or rather, which was already present in the body of the mother before confinement, as she had chills, had produced in the liver metastatic abscesses, and being communicated to the blood of the child, it had produced in him one of the forms of purulent infection, which carried him off.

Sixth Observation.—June 18th, 1879, I was informed that a woman confined several days previously, at Cochin, was very sick. On the 20th blood from the finger was sown and remained sterile. July 15th, or twenty-five days later, blood from the finger was sown, but with no development. In the lochia no well-recognized organism was discovered. The woman was, however, said to be very sick. She died on the 18th of July, at 9 A. M., after a long and painful sickness, as it extended back a month and she was unable to stir without great pain. The autopsy on the 19th, at 10 A. M., was very interesting. She had suffered from purulent pleurisy, with a considerable pouch of pus and false purulent membranes on the pleura; the liver was whitish, greasy in aspect, but firm and without apparent metastatic abscesses; the

uterus, quite small, seemed healthy, but on the exterior surface whitish nodosities were found, full of pus. There was no appearance of lesion *in the peritoneum, which was not inflamed*, but there was much pus in the joints of the shoulders and in the pubic symphysis. The pus of the abscesses was sown and gave long chapelets of grains, as well as the pus of the pleura and that of the shoulders, and of a lymphatic of the uterus. The fact is curious, though easily understood, that blood taken from the arm, collected three-quarters of an hour after death, gave a sterile culture. Nothing appeared in the fallopian tubes, nor in the round ligaments.

Interpretation of the Disease and of the Death.—The pus formed in the uterus after confinement had become associated with germs of microscopic organism, which had grown and afterwards passed into the lymphatics of that organ, then giving rise to the formation of pus in the pleura and in the joints.

Seventh Observation.—On June 18th I was informed that a woman had been confined five days previously at Cochin, and that fears were entertained on account of the operation (embryotomy) which had been performed. The lochia sown on the 18th, the next day, gave no fecund culture the day after. Having received no news from the patient since the 18th, I presumed (the 20th) that she must be better. I inquired, and received for answer: “*The woman is doing very well ; will be discharged to-morrow.*”

Interpretation of the Facts.—The pus naturally formed on the surface of the wounded parts had not been mixed with outside organisms. *Medicatrix nature* won it; that is to say, that life on the surface of the mucous membranes had prevented the development of the foreign germs. Pus was easily resolved, and a recovery took place.

Will the Academy, in closing, allow me to lay before it some ideas that I am disposed to consider as legitimate deductions from the observations I have had the honor to relate?

Under the designation of *puerperal fever*, are placed various diseases, but all seem to be the consequence of the development of common organisms, which by their presence infect the pus naturally formed on the surface of the wounded parts, and which

from their spread under different forms and in various ways in the blood or lymphatics in a certain part of the body, give rise to morbid forms, varying with the state of those parts, with the nature of the parasites, and the general constitution of the subjects. Whatever may be this constitution, does it not seem that in resisting the production of the vulgar parasitic organisms, recovery might take place in all cases, except perhaps from those which the body would already contain before confinement, by the presence of impure abscesses, internal or external, or microscopic organisms, as we have seen in a preceding example, (fifth observation). The antiseptic method seems to me to be powerful in the great majority of classes. It appears to me that *immediately after confinement* one ought to commence the applications of these antiseptics. Carbolic acid may be very useful, but there is another antiseptic which I would recommend ; it is boric acid, in concentrated solution, at ordinary temperature, that is 4 p. 100 about. This acid, whose singular effect on the life of cells has been shown by Mr. Dumas, is so slightly acid that it is even of alkaline reaction, with some proof papers ; besides which it is odorless, thus differing from carbolic acid, whose odor is so offensive to patients. Again its innocuousness upon mucous membranes, especially the vesical, is every day tested in our hospitals. Here is the occasion where I first used it. The academy will remember that I have shown, and it has not been disproved, that ammoniacal urines are always produced by a microscopic organism, resembling much, in several particulars, that of furuncles. Later, in common with Mr. Joubert, we found that a solution of boric acid was fatal to that organism. From that time and since 1877 I have advised Dr. Guyon, surgeon at Necker, (section of genito-urinary diseases,) to try the injections of solutions of boric acid in diseases of the bladder. I have reports from him that he has obtained thus far excellent results from it. He has even told me that he never performs lithotritry without such injections. I speak of these facts only to show that boric acid is inoffensive to a very delicate membrane ; indeed, the bladder can be safely filled with a tepid solution of boric acid.

To return to confined women : Would it not be very useful to

have near the bed of each patient, easy to reach, a concentrated warm solution of the acid, with compresses that could be often changed, to be used from the time the labor is finished? It would also be prudent to have those compresses previously warmed, to say 150°, a heat more than sufficient to kill all the germs of vulgar organisms. Were I sufficiently authorized to name this communication as I did, (I have stated the facts as they were reported to me and have mentioned my interpretations), still I know that in medical investigations it is difficult to avoid interference with preoccupied ground. Again, I do not forget that medicine and veterinary science are strangers to me. For this I ask the judgment and comment of this illustrious society. Indifferent to frivolous and capricious objections, and with just contempt for the vulgar scepticism which adopts doubt as a habit, I look towards the militant scepticism which properly makes doubt a stimulus to inquiry, and whose rule of conduct has for its motto: "more light." I am pleased to thank Messrs. Chamberland, Roux and Doleris for their kind assistance in collecting the observations I have now presented.

EDITORIAL.

MEETING OF UNITED STATES VETERINARY MEDICAL ASSOCIATION.

The good city of New York, the great metropolis of our great country, was quite recently the seat, by previous appointment, of the annual meeting of the American Medical Association. The occasion proved, in every way, a magnificent success, as well through the large numbers of delegates in attendance from all parts of the country, as in the number of excellent papers which were brought before the different sessions of the Association.

In a few weeks, a somewhat similar gathering will again take place in this city, viz: the annual meeting of the *United States Veterinary Medical Association*, at which, also, many members will doubtless be present, and where, we hope, the profession will be well and largely represented.

Entering on its 17th year, the Association has effected much good. It has created amongst its members relations of professional friendship which have proved most pleasing, and has brought together veterinarians from different parts of the country, and no doubt much benefit has been derived by the members from the annual reunions.

As the Association grows older, and as the number of veterinarians increases in the country, the number of its members must also increase, and the existence of the Association and its works cannot fail to prove, in time, one of the foundation stones upon which American veterinary science will be established.

Of the works done by the Association, perhaps none can be considered more beneficial than the establishment of its organ, the AMERICAN VETERINARY REVIEW. This publication, now in its fourth year of usefulness, has slowly but surely made its way to the favor of the profession, and has acquired a position that enables us to say that to-day our European brethren are looking upon it as the representative of veterinary medicine in America.

We are not aware of any special work, or of any special paper, or subjects, which are likely to be brought before the meeting; but we hope there will be such. There are few items of general business to be attended to, and the work of the *comitia minora* will occupy but a very short time. We must therefore look for interesting productions from the members who intend to be present, for the profitable appropriation of the time.

There are many important questions which may with great propriety be brought under the notice of the Association. The General Education of Veterinarians is one; General Sanitary Medicine is another; a Revision of the Laws of Soundness might not be out of place; and how many others? Then again, we have the matter of the prizes which are offered by the Association for the best essays, which, we hope, will not be ignored, notwithstanding the unfortunate determination of last year's attempt.

Taking it on the whole, there is for such a meeting plenty of opportunities for good and honest work, and it becomes the officers of the Association, President, Secretary, and Chairmen of Committees, to see that our friends who come from long distances

shall not return home without having derived great satisfaction and profit from their visit to New York.

We would call the attention of veterinary book buyers and students to the advertisement of Mr. W. R. Jenkins, who, we happen to know, can fully supply all demands for veterinary literature. Recognizing the importance of the profession and its requirements in the way of standard works of reference (too few of which are published), he has made a specialty of this branch of book selling and publishing, and has gathered together the largest assortment of books relating to domestic animals to be found in any book-store in the country.

The gelatine capsules advertised in the REVIEW by H. Planten & Son have proved in our hands an excellent vehicle for the administration of medicine to our large animals. For those who prescribe volatile compounds, they will be found very excellent and practicable, and more eligible than the usual covering of paper. They are certainly worthy of a trial.

HUMAN AND ANIMAL VARIOLÆ: A STUDY IN COMPARATIVE PATHOLOGY.

BY GEORGE FLEMING, F.R.C.V.S., ARMY VETERINARY INSPECTOR.

(From The Veterinary Journal, London, England. Reprinted from the Lancet for January 31st.)

The recent conference held in London on Animal Vaccination will not have been without a useful result, if it has been the means of not only drawing attention to this particular subject, but also to the very meagre knowledge we seem to possess with

regard to variola in animals, and, indeed, of all animal disorders which are communicable to mankind, and *vice versa*. The discussions which took place at the meetings of the conference afforded another proof of the necessity of instituting what I have for years maintained should form a branch of medical study—a chair of comparative pathology at each of our medical schools. Surely a knowledge of animal diseases, in their relation to those of our own species, is of far more moment to the surgeon or physician in the practice of his profession, than an acquaintance with zoology or comparative anatomy. Such chairs are established in nearly all, if not all, Continental medical schools, in which their value has long been recognized. Why is it, then, that we are so slow or so unwilling to adopt what is so manifestly and so urgently required in order to complete the student's education, and to render him a more useful and enlightened member of society.

From the opinions expressed at the conference, as well as elsewhere, I gather that the view is largely entertained among medical men in this country, that human and bovine variola, or vaccinia, are one and the same disease: the latter being dependent for its origin and maintenance upon the former, though undergoing a certain and special modification in the passage of its virus through the organism of the ox; so that, when re-transplanted in the human species, it is no longer small-pox, though it offers protection, partially or wholly, permanently or temporarily, against an attack of that malady.

It would also appear to have been accepted by those present at the conference, that there are only two distinct kinds of variola—one affecting man, and the other the sheep. And one opponent of animal vaccination, in dwelling upon the dangers likely to attend that operation, pointed out the existence of several diseases which, he asserted, bovines are liable to, and which he would lead us to infer might be communicated to those vaccinated direct from the calf. Among the diseases he enumerated were contagious pleuro-pneumonia, anthrax, glanders, certain disorders due to helminths, and “entozootic asthma.”

Now, without at present claiming to be a supporter of animal

vaccination, I may as well state that the apprehended danger from these disorders is more or less purely imaginary. Contagious pleuro-pneumonia is peculiar to cattle, and cannot be transmitted in any form to other species, not even by direct inoculation of its morbid products; glanders is not a bovine disease, and all attempts to convey it to the ox tribe have invariably failed; anthrax runs its course too rapidly, and is too marked a disease to be considered in connection with animal vaccination; the worm disorders have no relation to the subject under discussion; while as for "entozootic asthma," why, I never heard of it before, and I fancy nobody else, so that it may also be dismissed as unworthy of consideration. Candidly speaking, if I anticipated any danger in animal vaccination, from the presence of constitutional disease in the vaccinated calf—which I do not at present—I would rather be inclined to look upon the existence of tuberculosis with some suspicion; but this serious malady the speaker did not refer to. There is, however, no evidence that it can be conveyed to mankind by retro vaccination; and, to my mind, the risk is so infinitesimal, considering that the calf is so rarely affected with the disease, at least in an active form, that I think it may not be taken into account just now.

Of infinitely greater importance is the relationship between human small-pox and cow-pox, which was treated as a merely collateral subject at the conference, but was, nevertheless, made the occasion for some strong opinions being expressed as to the absolute identity of the two maladies. The solution of the problem as to whether small-pox and cow-pox are one and the same disease, modified only in their manifestations by differences in the organism of man and the ox, or whether they are distinct and independent disorders, having only a family or generic resemblance, well deserves the most serious efforts; constituting, as it does, a question of the very highest scientific and practical interest, and one about which there should be nothing speculative. Its practical aspect more particularly invites examination, for if it be demonstrated that the two are identical, the cow-pox being derived from small-pox, then there is no occasion to hesitate as to the selection of vaccine lymph; for we might, without compunc-

tion, take that which is directly elaborated in cows through inoculation with the small-pox matter of man, and thus save all the search and precautions at present imposed upon us in order to obtain a vaccine fluid which shall be innocuous, and at the same time sufficiently potent to afford protection from variola. But if, on the contrary, the small-pox communicated to the cow retains all its characters, and when again transferred to mankind merely reproduces itself in its dangerous, general eruptive and highly infectious form, then recourse to variolo-vaccination would be a serious and reprehensible step, and one which should be opposed. Or if the small-pox virus, in passing through the cow, should still retain its variola-producing attributes, but yet become so subdued as to be as harmless, and still as effective as vaccine, ought it to take the place of the latter altogether, or should it be employed simply as an auxiliary? These questions have been asked before, and I venture to ask them again, as a reply to them is of the greatest moment at this particular time, not only in regard to small-pox, but to other virulent affections. For if, notwithstanding the apparent differences in their characters, the human and bovine diseases are the same in nature, the virus only being beneficially modified or transformed by transference from the one creature to the other, it gives us reason to hope that the virulent principle of other contagious scourges which only attack once in a lifetime, may be similarly attenuated by emigration from one species of animal to another, and still retain its protective influence. But if the human and the cow disease are due to a different virus, and the one has power to neutralize the other, the reciprocal neutralization being greatly to the advantage of the creatures concerned, then also there is good reason for hoping that with other contagious maladies of the same, or even a different type, there may be discovered a similar means of destroying their germinative power.

Notwithstanding the immense importance of the question, the long time that has elapsed since vaccination was introduced, the multitude of works upon the diseases, and the great opportunities that have been afforded for clinical and experimental observation, it is indeed astonishing to find opinions still divided on

the subject of human and animal variolæ and their relationship. Strange it is to note doubt and hesitation, and unfruitful discussions as to the nature, advantages, and dangers of vaccination, when we reflect that it has been practised for ninety years, and is universally adopted all over the world as a prophylactic against one of the direst of the pestilences which haunt the human family.

But so it is; and, as before observed, the tendency among medical men, at least in this country, appears to be in favor of small-pox and cow-pox being due to one and the same virus; in opposition to the Jennerian doctrine, that the cow-pox was derived from horse-pox, and had none but an antagonistic relationship to human variola. Their belief seems to be founded on the reports of certain experiments performed by four or five persons (Gassner, Thiele, Sonderland, Badcock, Ceely), in which positive results were obtained some forty or fifty years ago, and on accounts of a few instances in which small-pox was said to have been communicated from sick people to animals. Jenner, according to this opinion, was mistaken; his cow-pox was not derived from "greasy-legged" horses, but from the small-pox-stricken people who went about and handled the milch cows, and so infected or inoculated them. It follows that only cows were (and are now) affected; that cow-pox was much more prevalent in those days than now, because small-pox was more prevalent; that only mankind and sheep have a distinct variola of their own, for the simple reason that those who entertain this opinion never saw or heard of any other species being affected with variola; that failures in recent attempts to produce cow-pox, by inoculating cattle with small-pox virus, and the production of small-pox when the matter of the eruption was transferred from the cows to children, were due to the human virus being merely deposited in a little pouch in the animal's skin, where it did not undergo the supposed modification; and that, though all recent experimenters have failed in developing cow-pox from small-pox, yet at the period mentioned it was accomplished without difficulty.

Deeply impressed with the vast importance of arriving at the truth in such a grave question, I have for many years devoted much attention to it, and have already done what in me lay to

settle it: at least as far as the variolæ of animals are concerned, as will be seen on referring to my work on "Veterinary Sanitary Science and Police" (vol. ii., p. 28); and I will now venture to dispute every one of the arguments brought forward to prove that human variola and cow-pox are due to the same virus, or are the same disease; or that there are only small-pox and sheep-pox as distinct variolæ. With regard to animals, I may at once state that I believe every species has its own independent and particular kind of variola, and I am unable to understand why man and the sheep should alone have the unhappy privilege of being the special subjects of different forms, and this privilege be denied to all the other creatures.

Whether these forms may have been originally derived from a common or primitive source or type, I will not now stop to inquire; but that they exist and compose a group of diseases rather than one malady, cannot be matter for doubt. That they more or less widely differ from each other, that in each species each form has a special character, and though that which is particular to one species may be transmitted to another species, yet the variola of this species need be scarcely a subject for dispute; while the fact that their differences are marked, not only with regard to their particular features, but also as to their capability of transference to other species, and their antagonism to each other, has been clearly demonstrated. Admitting that which I shall presently attempt to prove, that the cow has its own variola, we know that when this is communicated to man it does not produce small-pox, though it protects from it. The sheep-pox has been inoculated on man by many experimenters—among others, by Marchalli, Sacco, Voison, and Hering, but only a small localized group of pustules, quite unlike the eruption of ovine variola, has appeared at the seat of inoculation, and no protection from small-pox or vaccinia has been conferred. Neither human variola nor yet vaccinia will give rise to sheep-pox, neither will their inoculation protect the sheep from its own variola. Horse-pox is communicable to the cow and mankind, and protects them from their variolæ, as well as the human species from vaccinia, while vaccination protects the horse from its pox. As we shall

see immediately, though the virus of human small-pox, when deposited in the skin of the cow, does give rise to a local papulation—often very trifling, exceptionally very marked—yet this is not the regular eruption of cow-pox, either in its appearance or course, and it does not prevent the cow being successfully vaccinated at the same time, though it appears to destroy the aptitude to receive vaccinia; while in two or three transmissions through the bovine species it becomes altogether impotent. The same results are observed in the horse, which, however, appears to receive the virus of human small-pox more readily, and to exhibit more marked local phenomena than the ox; while this inoculation also protects it partially, if not entirely, from the action of vaccine virus, which it otherwise so readily receives. As in the ox likewise, the small-pox virus soon loses its potency in being carried from one animal to another—it cannot be cultivated in them; and experiment has demonstrated, that no more in the organism of the horse than in that of the ox can human variola be transmuted, but that after passing through the bodies of solipeds, and again transferred to man, it has lost none of its characteristic features.

Cow-pox can be very readily transferred to man, the ox, horse, and goat, the first three showing an equal aptitude for its reception; in them also the transmission of the disease is indefinite—*i. e.*, the virus may be cultivated, without impairment, for a limitless number of generations, and it confers immunity against the variola of man and the horse, while the ox itself is protected. But while vaccination only produces in man and the ox a local and limited eruption, in the horse it often produces a startling pustular exanthem, which, in character and seat, differs in nothing from natural horse-pox. Another peculiarity in the action of the vaccine virus in the horse is its tendency to produce this vaccinal eruption, and at the same time to confer immunity, when introduced directly into the lymphatics or blood-vessels; while in the ox it does neither under this condition—all circumstances which would lend support to the opinion of Jenner, that the horse is really the true source of natural vaccinia.

Vaccination in the dog usually only produces small red nodules at the punctures, but nothing at all resembling the vaccinal erup-

tion. It is the same with the pig. In the sheep a small papule generally forms at the seat of inoculation, with rarely a little vesicle that rapidly becomes encrusted. Re-vaccination from this to calves gives negative results.

Not only in their special characters do the variolæ of man and animals differ, but also in their apparent mode of extension. Human variola and sheep-pox differ widely from each other in some respects, particularly in their not acting antagonistically, and in the appearance of the eruption, but they are identical so far as their diffusion is concerned. They are both infectious and contagious, and can be transmitted by fomites, as well as by actual contact; while their virus possesses a vital resistance somewhat remarkable. Cow-pox, horse-pox, and the variolæ of other animals would appear to depend for their dissemination upon their contagious properties only, and their virus readily becomes deteriorated.

There are other peculiarities in the variolæ of man and animals which still further differentiate them, but these I shall not allude to here; so pass on to the consideration of the far more pressing question as to the identity of small-pox and cow-pox, and an examination of the arguments brought forward in support of this identity. But before doing so, I may as well confess that I do not for a moment hold with the abiogenetic or "spontaneous" origin of variola either in man or beast, and am prepared to maintain that whenever and wherever, and in whatever species the disease manifests itself, it is always due to its own special contagium, no matter how this may be conveyed.

It has been stated that cow-pox is now a very rare disease, and that the probable cause for its being more frequent in the days of Jenner was the much greater prevalence of small-pox; thus leading to the inference that the one disease was dependent on the presence of the other. But this statement will not bear close examination. We have no definite evidence to prove that cow-pox was a common disease before vaccination became general, nor yet that it is a very rare malady now; still less that its frequency had any relation to the occurrence of small-pox. We have only the testimony of Jenner, and two or three other observers of the

early part of this century, and they may have witnessed merely local outbreaks, such as occur now and again in different countries. It appears to have been known from time immemorial, and was certainly so in India, Persia, South America, and the continent of Europe long before the time of Jenner. But it had not been studied until Jenner's discovery, and its presence may have often been overlooked, or it may have been confounded with other bovine disorders. Soon after the announcement of the protective influence of vaccination on man, cow-pox was sought for and found at Castres, Nancy, Metz, Strasbourg, and Rambouillet, in France, as well as in various parts of Italy, Prussia, Spain, Wurtemberg, Holstein, Denmark, and elsewhere in Europe. That cow-pox did appear, and that it was, perhaps, somewhat common in that part of Gloucestershire in which Jenner resided, and indeed in many places in England, is not at all denied; but that its prevalence was owing to small-pox being rife, is opposed to all clinical and experimental evidence. Small-pox is transmitted with difficulty to the cow, and does not produce cow-pox, as I have already asserted. If cow-pox was more common a century ago than at present, this may be due to the greater care bestowed upon cattle in their dwellings, and more general good management now than formerly. Dairies are kept cleaner and more wholesome, and people who milk and go among cows are more proper in their own persons than they probably were years ago; consequently if a case of cow-pox does appear, it has not the same facilities for transmission to other cows. This transmission appears to be mainly effected by the milker; the vesicles, being chiefly localized on the udder or teats, are ruptured in the act of milking, and the virus on the dairymaid's hands is transplanted to the lacteal apparatus of the cows she next milks. Sores are frequent on the teats, and the presence of these renders vaccination all the more certain. It is very unlikely that people affected with small-pox would work in dairies, and still more unlikely, if they did so, that they would infect the cows. If cow-pox could be produced through the medium of diseased dairymaids, it ought to be more common now than before vaccination was introduced, seeing the great difficulty with which small-pox is transferred to

the cow (when it does not produce vaccinia), and the readiness with which this animal is vaccinated.

If small-pox could accidentally give rise to cow-pox, surely evidence of this would be forthcoming at the present day, when we have frequent, severe and extensive outbreaks. There are certainly instances recorded of this so-called accidental transmission, observed many years ago, as well as coincident outbreaks of cow-pox in localities where variola was prevalent; but these instances are so very few, and depend, seemingly, upon such a mere chance, that they cannot be accepted as affording reliable proof of the actual possibility of such transmission; while the fact that small-pox prevails intensely over wide districts at times, without variola being observed in the bovine or other animal species, as well as the other fact that cow-pox is observed here and there—individually, sporadically, enzoötically, and even epizootically—without, however, small-pox being observed, goes far to negative the likelihood of accidental transmission.

That cow-pox may be a less frequent disease in this country than formerly, is quite possible, and, for the above reasons, very probable; though in this respect England would not be an exception, for the veterinary professor, Spinola, mentions that it was a somewhat common malady towards the end of last century all over the German littoral of the Baltic; but to-day it is rare. Like all other diseases of this kind, however, it would appear to have its periods of subsidence and recrudescence. Neumann states that in Holland, in certain years, it was seldom seen, while in others—as in 1805, 1811 and 1824—it was rather frequent. Ritter says that in Schleswig-Holstein it is always present to some extent, but that in some years it assumes an epizootic form and is propagated from herd to herd—as in 1824, 1826, 1829, 1830 and 1832.

Now and again, too, we read of isolated outbreaks in different countries, which attract attention because of the large number of animals affected. The most recent of these is that recorded by Professors Oreste and Sabbatini in 1876 (*Gazetta Medico-Veterinaria*), as occurring among a herd of buffalos, more than two hundred of these animals, young and old, being attacked. The eruption in the cows was chiefly confined to the udder and teats,

but the sucking-calves had it on the nose and lips. The pigs which consorted on the same pastures were not infected. The eruption was typical. According to the *Deutsche Zeitschrift für Thiermedizin* (December 1879), cow-pox appeared as an epizooty in the summer of 1876, in the vicinity of Reykjavik, Iceland. It had never been seen there before, and caused very great alarm; all the milch cows became progressively affected, and in several instances milkers got inoculated in the hands. Neither in this, nor any other of the outbreaks mentioned above, is any allusion made to small-pox being prevalent in mankind.

In this country we have no means of arriving at any conclusion in regard to the extent to which it may prevail, as no reports are called for by government, and veterinary surgeons are seldom, if ever, required to attend cases of cow-pox, these being usually so trifling. Indeed, it is not at all improbable that many pass unperceived, and those observed are not mentioned by dairy-keepers or milkers, or they may look upon the eruption as analogous to that which is sometimes seen on the teats or udder after parturition. The vesicles are broken, too, almost before they are developed, in the act of milking, and the sores which result are considered to be only simple abrasions or fissures, so common in this region. Therefore it is that there are very few veterinary surgeons, even of those practising in the most populous cattle districts in this country, who have ever seen a case of cow-pox. But we see no reason for thinking that the malady is much less common here than elsewhere—say in Wurtemberg, where the government reports, drawn up by district veterinary surgeons, are very full and complete, and where rewards are offered for every case of cow-pox from which children can be vaccinated. According to Hering, (*Reportorium der Thierheilkunde*), in Wurtemberg, during the ten years from 1827–37, there were sixty-nine cases out of eighty-four which furnished an excellent vaccine lymph, and 152 out of 208 cases in which the lymph did not yield such satisfactory results; making in all about thirty reported cases every year. In 1873, there were thirty-nine cases, from which fifty-two children were successfully vaccinated; the cases were most numerous in April (18), May (13,) and June (8), and one

instance of accidental infection was reported—a farmer's wife who had milked a cow in which the pustules had arrived at maturity, had a vaccine vesicle on the thumb. In 1874, twenty-four cows and four heifers were reported, but complaints are made that the information with regard to these came too late to make many of them available for vaccination—the pocks being either in the last stage, or ruptured, and only sores remaining. Nevertheless, lymph was procured from twelve, and with this twenty-five to thirty children were successfully vaccinated. Some interesting details are given with regard to these cases of cow-pox, one of which was an example of *variola succinea*. Surgeon Löffler, of Rottenburg, received on April 20th, one of the heifers—a two-year-old animal, twenty-five to thirty weeks pregnant, and very healthy. On the two posterior teats of the right side were three fine pustules, and on the last teat of the left side was another. On opening these a yellowish glutinous fluid escaped. On the 23d, new pustules appeared. The udder and teat were hot, and on the latter were several small and large oval pustules, each with a red areola. When opened there flowed a yellow thick lymph from them; there was a very small quantity of clear lymph at the end. Two children were inoculated by puncture, and an additional quantity of lymph mixed with tepid water, was poured into the wounds. In one child there were developed four perfect and fine (*Vollkommen schöne*) silver-hued pustules, and in the other child one pustule. From these two children five others were successfully vaccinated. Another similar case is related by Dr. Kieser, of Gmünd, in which the cow was three years and a half old, and yielded lymph with which three children were vaccinated, and from these a large number. The details of these cases are full of interest, but I cannot dwell upon them here. I may mention, however, that among the cows were two cases of *V. vacc. nigr.* In 1875, twenty-three cases of genuine, and seventeen of spurious cow-pox were reported. Nine of the former yielded satisfactory inoculations in children, and the owners of the animals were consequently rewarded. One cow was reported to have shown a succession of genuine pox for two years; it was seven years old, and was pregnant with the fifth calf. On the udder, on April 14th

were a number of pustules, from the size of a pea to that of a kreuzer, surrounded by a red border, and containing a partly watery-looking and partly milky-looking lymph. In the course of the next day the pustules became desiccated. On April 24th four new pustules were seen; these soon became encrusted, and were succeeded by others which were merely abortive pustules, and the case continued under observation for some time, not as one of vaccinia, but as one of chronic pemphigus. In 1876 it is again complained that cows were only reported as affected with pock when they became visibly unwell, the secretion of milk diminished, and the teats so swollen and sore that milking was impossible. There were forty-six cases reported, twenty-one of which were genuine, and twenty-five spurious. Successful vaccinations were notified in a number of children, as well as some instances of accidental infection. One of the latter was a girl who daily milked a cow which had calved fourteen days previously; three teats of the animal had sores and pustules on them, and the girl inoculated her nose through scratching it while she was milking. In 1877 it was very prevalent, especially in July and August; in many cases difficulty was experienced in milking the cows, the mammæ often requiring to be relieved artificially, and mammitis being frequently observed as a complication. Several cases were timeously reported, and accidental inoculation of people was noted. In the ambulatory clinic of the veterinary school there were 106 cows affected with ordinary cow-pox during the year, and eleven with the tubercular or nodular form (*Knotenförmigen*.) In 1878 thirty-six cows and two calves were reported, but in consequence of reaching them at an unfavorable period, lymph was collected by the district veterinarians from only five cases; this was successfully utilized. The Minister of the Interior had offered a reward of twenty-four marks to owners of cattle for every animal they timeously reported as suffering from cow-pox.

None of the other German States include this disease in their reports. Belgium has issued recently a Health Report of Animals ("Etat Sanitaire des Animaux Domestiques"), published in the Bulletin of the Conseil Supérieur d'Agriculture. In that for 1877, I find that at Châtelet there was an outbreak of vaccinia

among dairy cows; but when the veterinary surgeon saw them the attack was subsiding, and on the cows still affected the pustules were either broken or dried up. Before the eruption appeared the cows gave an abundance of milk, and were grazing in the fields. At Wornmen a large number of cattle were affected with vaccinia, and the same reporter mentions pigs as being affected with variola in the same district.

Cow-pox appears in the Danish Health of Animals returns; and I observe that in 1875 there were included in the returns twenty-six cases of natural cow-pox throughout Norway, while in 1878 there were reported 581 cases in sixty nine localities, forty-five of these being in Northern Seeland. They occurred as in other countries, all the year round, but were most numerous towards September.

I have taken the liberty of bringing forward this evidence to prove that cow-pox is not an extinct disease; that the chance cases reported in such small countries as Wurtemberg, Belgium and Denmark amount to a considerable number in the course of the year; that there is ample clinical and experimental proof that the malady is really vaccinia, and has no relation whatever to human variola; that the presence of the disease in isolated cases or in a sporadic condition, gives it the power of assuming an epizootic form when circumstances permit; and that, although it is more or less denied that cow-pox exists in this country, there is every probability that it is at least quite as common as in Wurtemberg, though perhaps less so than in the days of Jenner.

With regard to the localisation of the disease in the cow, it is quite true that the mammæ and teats are the special seat of the eruption, just as the mouth, lips, and limbs are the ordinary situation of the horse-pox. Nevertheless, cases now and again occur in which, as also in the horse, the eruption is not limited to the usual parts, but appears on the muffle, nostrils, and other regions where the skin is thin and the hair scanty. Pilger D'Arboval and other veterinarians testify to this, as also do the Wurtemberg reports. But the eruption is very far from being general over the body, even in these instances.

The female sex of the animal has been brought forward as an

argument in favor of cow-pox being communicated by the hands of persons affected with small-pox. But it is quite forgotten that there are more cows than bulls or bullocks; that they are generally completely under observation in cowsheds; that when in milk their teats are constantly handled, and therefore the eruption can be felt and seen, while inoculation from cow to cow is made all the more easy, and the disease, consequently, much more diffused than it would otherwise be. With the bull or the bullock, on the contrary, there are none of these opportunities for observation or extending the contagion. The bull is seldom indeed with the cows, and then only for a brief period; while the parts which might be the seat of eruption are rarely handled, and perhaps never examined. The bullock is still less, perhaps, exposed to contagion or submitted to examination. But I entertain no doubt whatever that both the bull and the bullock do suffer from vaccinia, and it is quite ridiculous to imagine they do not. Male bovines have been largely employed in vaccination experiments on the Continent, and the vaccine lymph has acted as promptly and effectively on them as on the cow. At Bâle, the veterinarian Sigismund for a long time furnished the vaccinators with lymph cultivated on bulls which were intended for slaughter; he inoculated them on the scrotum. Chauveau has also successfully vaccinated bulls, and so have other experimenters. Roloff, of the Berlin Veterinary School, has demonstrated how easily the bull could be infected. He slightly abraded the skin of the scrotum, and gently rubbed the vaccine lymph upon it; the characteristic eruption took place in due course. If bulls or bullocks stood in cattle-sheds with an equal number of cows, and were treated and exposed to contagion in the same way as these, there is every probability that we should have bull or bullock-pox frequently enough. Where this association is allowed to take place on the Continent, bulls and bullocks are infected. An interesting case of this kind is recorded in the *Repertorium für Thierheilkunde* for 1879. A bull two-and-a-half years old, is there described as affected with vaccinia, the pustules and crusts being situated on the scrotum, a hind and fore foot, and lips. The animal suffered a good deal. The lymph from the

pustules was employed with success in the vaccination of children. So that it is simple nonsense to assert that the male bovine is exempt from vaccinia; and it betrays ignorance of what has been observed by competent men, as well as lack of knowledge of pathology in general and this disease in particular.

(To be Continued.)

EXTRACTS FROM FOREIGN JOURNALS.

SUPPURATIVE BRONCHITIS IN A PIG, PRODUCED BY SPORES OF TILLETIA CRIES.

The majority of the diseases lately attributed to the spores of tilletia cries have had for their seat the mucous membrane of the digestive apparatus. (See Drs. Albrecht, Koch, &c.) In some cases, the simultaneous existence of a catarrhal rhinitis has been observed, and in another mention has been made of a special action exercised by these spores upon the uterus (Gerlach).

No notice of any alteration attending the lesions produced by their action upon the mucous of the bronchia has yet been published. Berndt thinks that the publication of the following case may be of interest.

Called the third day of August to examine a pig which had died, he found that the animal had lost its appetite for the last eleven days, and had since suffered from diarrhœa, very severe towards the last days, and then becoming complicated with dyspnœa.

At the post mortem, the skin and muscles were found normal, the stomach contained a small quantity of a yellowish viscous fluid; the gastric mucous membrane presented near the cardiac portion an inflammatory redness, and towards the pylorus erosions appeared of various sizes, with also slight infiltration. A grey-yellow fluid formed the contents of the intestinal canal; the mucous of the larynx and trachea presented catarrhal lesions, the trachea being in different parts the seat of erosions of different sizes.

The anterior half of the pulmonary lobes had a greyish-red tint and was somewhat firm; these altered parts of the lungs sunk in water. On a surface of a section of the atelectasic parts of the lung, were seen numerous yellowish spots surrounded by a clear zone quite distinct from the surrounding parts. The yellow center of these nodosities could be easily removed, and when of certain dimensions, they would leave little depressions with smooth walls. The surface of a section made through the parts of the lungs closed to the bronchia (large or of medium size) presented the same characters.

Fresh sections of the little spots, examined with the microscope, showed the larger and smaller bronchiæ to be the seat of peculiar alterations. The walls of the bronchial and the peribronchial connective tissue were sclerotic and formed the clear zone which surrounded the spot mentioned above.

The cavity of the bronchiæ was filled with epithelial and round cells—detached white blood cells—separated by quite large corpuscles; these cells were of a brown color and had a star shape. The corpuscles were abundant in a fresh section and always presented the same sharp form.

The parenchyma of the lung was atelectasic behind the bronchia obliterated by the masses of cells. Upon the tracheal mucous were also seen numerous spores of tilletia, especially upon the ulcerated spots.

The contents of the intestines were not examined with the microscope, but on the food and bedding of the patient, numerous vegetations of tilletia caries were found. No doubt, the spores of this fungus were the cause of the suppurative bronchitis.—*Annales de Belgique.*

FORM OF RABIES DEVELOPED IN A DOG AFTER GREAT EXCITEMENT.

In May, 1871, during one afternoon, a dog of quiet disposition had played with the children of his master, who excited him and made him run until he was entirely exhausted. The next day he was shown to Mr. Cagny, Veterinary Surgeon. He found the dog dull, very irritable, lying back in its kennel, and without

appetite. Putting aside the suspicion of hydrophobia, a diagnosis of over-fatigue was made; still the general condition of the dog remained the same, and the physiognomy of the patient became suspicious. A neighboring dog irritated him by its presence and had to be taken away. One day he bit his master, and was killed.

Was this a case of spontaneous rabies or a rabiform nervous affection? No rabid dog had been near the place for over a year; the other dog which was bitten by him never had rabies, and the owner never suffered from the bite he received.—*Pecueil de Medecine Veterinaire*.

INDIGESTION IN A HORSE. ANTE MORTEM RUPTURE OF THE DIAPHRAGM AND POST MORTEM LACERATION OF THE STOMACH.

Mr. Ladague was one night called to see a horse suffering with colic, and received the following history of the case.

Eight days previous the horse had had a slight colic, which lasted an hour and a half. Since then he had worked on the farm with the other horses. During the day he had eaten about ten pounds of hay, and in the evening a good ration; what quantity is not known. At half past nine he showed colicky pains, pawing and lying down and getting up easily, and when down remaining flat on his bed. From the moment he was taken, to the arrival of Mr. L., he had assumed the dog sitting position three times. Mr. L. found him standing, with face contracted and eyes injected, nostrils dilated; legs spread apart; no tympanitis; pulse, hard, 61; respiration, 26; frequent gaspings. Diagnosis: stomachal indigestion. Treatment: bleeding; drench of alcohol, acetate of ammonia, &c.; frictions; walking exercise.

An hour later he passed manure in small quantity and micturated. Returned to his stable, he occasionally laid down; no vomiting; assumed the dog position seven or eight times, and died in the morning while lying on the right side.

Post mortem the next day showed the abdomen very tympanitic; intestines full of gas; small one highly congested along over two yards of the posterior part of the floating portion; no invagination, volvulus or strangulation. The stomach was of

enormous size, weighing about forty pounds, and presented a laceration in the middle of the posterior face of the right cul de sac, about ten centimeters from the great curvature and parallel to it. The edges of the laceration were bloodless, clean and without ecchymosis. The contents of the stomach had passed through the opening into the abdomen.

The stomach being removed, a very irregular laceration of the diaphragm was found, beginning a little above the foramen of the right pillar of the muscle, somewhat to the right, and running down through the left pillar. It was at first horizontal and then extended obliquely upwards. The section of the fleshy part of the right pillar was complete and irregular. The edges presented little blood clots and ecchymotic spots. A similar condition was found on the fibres of the left pillar and through those of the phrenic center, which were also torn. Some portions of those, however, were also bloodless.

The case was thus proved by the post mortem to have been rupture of the right and left pillars of the diaphragm, before death, which was increased by the formation of gases in the abdominal organs, which gases also produced the laceration of the walls of the stomach after death.—*Recueil de Medecine Veterinaire*.

CONTRIBUTION TO THE STUDY OF THE TRANSMISSION OF TUBERCULOSIS.

By M. H. TOUSSAINT.

Veterinary pathologists agree in admitting that tuberculosis is unknown or at least very rare in pigs. This however, is not due to an inaptitude in that animal to contract the disease. The experiments of Mr. S. Cyr, in 1874, repeated since by several other pathologists, show evidently the facility with which the tuberculous infection takes effect in pigs. While nothing is more common in slaughter-houses than tuberculous organs of oxen or cows, one will look in vain for tubercles in a pig.

To what cause may these differences be attributed in animals

which are so readily infected by experimental methods? The experiments I am about to relate may answer this question.

First Series.—Three pigs, six to eight months old, were used. They had been kept for five months in the yards attached to the laboratory, and were in good health, large and fat. They were numbered 1, 2, and 3.

On the 29th of September, 1879, No. 3 was placed apart, and Nos. 1 and 2 were fed with the entire lung of a tuberculous cow, obtained from the abattoir, and containing a great quantity of tubercles. It was devoured with apparent relish by both animals.

Two days later, the yard being well washed, No. 3 was allowed to return to it. No. 2, a sow, was placed in a special lodge by herself, as she was advanced in pregnancy, and eighteen days later was delivered of a litter of five little ones, of which she crushed four, on which no post-mortem was held.

No. 1 was killed seventy-seven days after eating the tuberculous lung. During the last month he had lost much flesh, and the post-mortem revealed an advanced state of general tuberculization. The ganglions were hypertrophied, the soft palate ulcerated and all the organs and serous membranes of the splanchnic cavities were covered with tubercles.

No. 2, the sow, died in a very lean condition, one hundred and one days after the tuberculous meal. There was ulceration of the soft palate; a cretaceous condition of all the lymphatic glands; mammæ were full of tubercles, and all the parenchymatous organs, abdominal and thoracic, were filled with calcareous tubercular deposits.

No. 3, the little one of the above sow, died the same day. He was tuberculous, but the lesions were less advanced. He showed, besides, extensive pulmonary hepatization.

No. 4, the one which was first with Nos. 1 and 2, remained fat. He was killed after one hundred days of cohabitation. He showed a beginning of tuberculosis, limited to the maxillary and bronchial ganglions, with some granulations in the lung. In this case it seems certain that the transmission had taken place through the common feed rack.

Second Series.—No. 5. On the 18th December, a young pig

was given a portion of the lungs and ganglions from No. 1, and was killed after twenty-three days. There was nothing apparent on the surface of the organs, but the maxillary ganglions were hypertrophied, and under the microscope exhibited tubercular granulations in their first period of formation.

No. 6. On the 18th of December, tubercular ganglion was taken from No. 1, and a portion of it cut off and crushed and filtered through cloth. One cubic centimeter of this solution was injected into the left side of the soft palate. Fifty-seven days later, the left maxillary ganglion was enormous, while that of the opposite side was scarcely tuberculous. All the organs were full of tubercular granulations, some of which were white on the centre.

Third Series.—No. 7. On the 11th of January, 1880, the remains of No. 2, which died the day before, were given to a young pig. On the 10th of February the maxillary ganglions had become voluminous. On the 26th of March the animal was in extremis. When killed, it was found in the last period of generalized tuberculization. The soft palate was tuberculous.

No. 8. On the 11th of January, 1880, a pig two months old was subjected to experiment. Some of the blood from No. 2 was injected under the skin. It was followed by an irregular, hard and tuberculated tumor. Sixty-one days after, it was killed, and tubercles were found on the skin and the ganglions, and numerous gray granulations on the pleura, the lungs, liver, spleen and omentum.

To resume, these experiments show that the lesions of the pig belong to acute tuberculosis, and that they prove fatal in a short time, usually a few weeks. Tuberculosis of the pig is analogous to hasty consumption in man. The bovine family, on the contrary, is subject to chronic tuberculosis. From this, it results that young pigs, coming from tuberculous parents, offer but little resistance to the disease and die young; and that in adults which become tuberculous, the rapid march of the disease prevents reproduction.

In the point of view of contagion, these facts prove also that tuberculosis is easily transmitted, 1st, by the injection of tubercu-

lous matter; 2d, by heredity or nursing; 3d, by inoculation of the tuberculous matter or of the blood; 4th, by simple cohabitation.

In a future note I will show that the infection, in the case of injection or of contagion, takes place through the mouth.—*Academie des Sciences.*

ON THE ANATOMICAL CHARACTER OF BLOOD IN PHLEGMASIES.

BY M. G. HAYEM.

The study of the anatomical alterations of the blood, and especially of the evolution of those alterations, shows that the principal morbid stages have, so to speak, a special hematic character, the knowledge of which may be used in the diagnosis and prognosis of a certain number of diseases.

My attention being particularly called to the connections existing between the modifications of the hematoblasts and the formation of the fibrinous reticulum, I observed that the microscopical examination of the process of coagulation furnishes numerous instructive facts quite as positive as the dosage of the fibrine by chemical means.

To speak first of the phlegmasies, we shall be called upon to distinguish, 1st, the modifications in number of the elements of the blood, and, 2d, of the qualitative alterations which occur in it.

The present note will treat only of the variations in number.

I. *White Corpuscles.*—In the normal state the number of the white globules is in proportion specially to the age of the subjects.

In the woman the number is the same as in man, but it generally increases from 1,000 to 2,000 during menstruation.

It is to be understood that in all phlegmasies the number of white corpuscles is increased. This varies; out of 65 observations it oscillated between 7,000 and 36,500. The first figure was observed in a mild case of erysipelas of the face, almost apertical; the second in a case of double caseous pneumonia, with vomica. Most commonly, the number of white corpuscles is from

15 to 20,000. It is, therefore, threefold and quadruple more than in a normal state. One may say, generally, that it is greater, as the disease is more truly inflammatory, whether it is idiopathic or symptomatic.

Relatively to the march of this phenomenon, the following facts are observed :

1st. The increase of the number of white globules takes place from the beginning of the disease and reaches, regularly or by degrees, a maximum which corresponds to the period of maturity of the affection ; that is, for instance, with the suppuration in cases of suppurative inflammation.

2d. In decreasing phlegmasies, the number of white corpuscles diminishes in following closely the march of the disease.

3d. In suppurative inflammation, it diminishes immediately when pus comes out to the surface, to increase again when this is followed by secondary suppurative process.

4th. In the beginning of convalescence from truly acute forms of disease, one often sees, for a variable length of time, though short, (one, two, three days), the number of the white corpuscles diminish sensibly below the normal, before reaching definitely the physiological average.

This augmentation does not exclusively belong to acute phlegmasies with rapid evolution. If in these conditions it reaches its highest development, it nevertheless remains well marked in sub-acute and chronic affections, whether they be suppurative or only parenchymatous.

II. *Hematies*.—The numerical variations of red globules in phlegmasies depend on various conditions, and are, consequently, so irregular, that it is difficult to include them in a general description. One may say, however, that acute inflammation of eight or ten days' standing (pneumonia for instance) produces almost always a loss of from 200,000 to 1,000,000 of red corpuscles for one cubic millimeter. But this estimate is not absolute, as it could not be made out before the return of the number in perfect health.

It is at the moment of effervescence that the number of hematies reaches its minimum. It increases irregularly and more or

less rapidly during convalescence. At that time it is not rare to see it reach a very high figure, to be subsequently reduced.

When the phlegmasy is truly acute, and followed by rapid recovery, the number of hematies returns to its physiological standing in a few days. This numerical repair occupies a longer period after serious and protracted phlegmasies. It aborts when the acute is succeeded by a sub-acute or chronic stage. Even in these conditions one may observe a more or less marked anemia; in sub-acute articular rheumatism, for instance.

III. *Hematoblasts*.—The number of these, which normally is 255,000, is little modified during the period of acute phlegmasies with rapid evolution. In true pneumonia, it is generally a little above the normal number, while in most other inflammatory diseases it remains below, or scarcely reaches it. In general, the longer the disease, the smaller the number of hematoblasts. It may come down to 100,000, or even 75,000. It is towards the end of the phlegmasie that it reaches its minimum.

Then suddenly appears a rapid and progressive increase of the hematoblasts, an important and constant fact, which constitutes the most prominent and characteristic of the phenomena presented by the enumeration of the elements of the blood. In two or three days (in truly acute cases) the number of these corpuscles reaches a maximum twice, three, and four times that of the normal figure. This accumulation of hematoblasts, which by its intensity and constant presence constitutes a kind of hematical crisis, takes place at the time of effervescence; it begins when the temperature comes down.

It is intimately connected with the evolution of the lesion, and is observed as well in fatal cases as in those followed by recovery, provided the inflamed part enters into resolution.

It is equally so when the disease has several successive inflammations, each of the lesions terminating by an abundant production of hematoblasts.

At last, in cases where the disease has a slow march and a tedious effervescence, the increase of the number of hematoblasts takes place by successive steps, and it never reaches its maximum before a great number of days.

This important phenomenon corresponds with the diminution in the number of the white corpuscles; it is temporary, and is soon followed by the formation of new hematies.

In these circumstances, the return to its normal course ought to be considered as the consequence of a temporary accumulation of fresh elements at the time when the blood-evolutions have been stopped by the pathological process. This accumulation remains noticeable until the return of the equilibrium between the transformation of the hematoblasts into hematies and the production of new elements.—*Académie des Sciences*.

REPORTS OF CASES.

TRAUMATIC LESION AS AN EXCITING CAUSE IN THE DEVELOPMENT OF THE SYMPTOMS OF GLANDERS.

BY A. LIAUTARD, M.D., V.S.

The following cases are reported as being not only interesting in themselves, but also as showing the influence that traumatic lesions may exercise in the development of the external manifestations of glanders. Apparently in good health and able to perform their duties until they were submitted to surgical operations, the animals in question broke under the disease but a few days after they were operated upon, and that without exhibiting any suspicious symptoms until all the manifestations had become well marked. Still, there were in their history points to which I think particular attention ought to be called, and that in similar circumstances the practitioner will do well to bear them in mind.

A point in the first case is the species of the animal and her previous history, which might be considered as suspicious. In the second, the fact of the animal coming from a stable where glanders had been found a month before, and in each the fact of their having been kept in a large stable down town, and in that part of the city where glandered horses are likely to be mingled with others whose diseased condition had been undiscovered or overlooked.

Case 1.—FIBROMA OF THE SHOULDER JOINT—ACUTE GLANDERS.

On the 12th of February, 1880, a grey mule about 12 years old, kept in a poor stable down town, was brought to the hospital of the American Veterinary College for treatment. She had, on the right side at the base of the neck near the point of the shoulder, a large tumor. It was round, with somewhat well defined borders, hard and smooth; and beyond the fact that it had been submitted to several forms of treatment, which rendered the animal timid and sensitive, the handling of the tumor seemed to be painless. This swelling was not of recent date, and the mule had been treated for it several times, with the same result, viz., that the enlargement after some time always reappeared. Apart from this condition, the animal seemed to be healthy.

Looking at the case as one of fibroma, the removal of the tumor was advised and performed on the next day, the animal being thrown on the left side. The operation was quite simple. An incision was made lengthwise along the middle of the tumor; the skin was carefully dissected and the tumor well isolated. At the last stage of the operation, and as the mass was about to be removed, a small cavity on the center of the tumor was opened and the escape of about a teaspoonful of thin pus followed. The edges of the wound were brought together with quill sutures.

The animal was placed on good diet and the wound dressed daily with carbolized dressing. The suppuration was fairly established towards the fourth day, but it remained of thin watery character, yellowish in color. The granulations of the surface of the wounds were of a pale red color, flabby, and liable to bleed upon being touched.

About the 18th, the mule seemed to have a little cold; her temperature rose to 103; she coughed some and discharge appeared from both nostrils. On the 19th her appetite had diminished; the discharge of the nose was of a gluish, bad character, and the maxillary glands had become swollen. On the 20th, in the morning, her respiration became labored; bloody discharges were abundant from both nostrils; the lower part of the maxillary space much swollen and painful; farcinous cords appeared on both sides of the face on each cheek, and the septum nasi was

covered with ulcerations characteristic of acute glanders mixed with some having a more chronic character.

CASE 2.—FRACTURE OF THE LOWER MAXILLARY BONE—CHRONIC GLANDERS. On the 14th of June a grey mare well advanced in years, belonging to a trunk establishment, was brought under my observation.

About a month before, a black horse belonging to the same firm had been condemned for glanders. Her history is incomplete. She is said to have been first observed that morning with the lesion which she presented. She then showed a punctured wound on the left cheek, at the maxillary tuberosity, measuring about one inch and a half in length on the outside, and quite dry. On introducing the finger into the puncture, a number of pieces of bone could be felt, some loose, others adherent to the torn muscles. The pus, which flowed freely, was quite good in character. The hand, resting on the upper part of the flat of the cheek a little below the temporo-maxillary articulation, received the sensation of crepitation when the jaws were put in motion, as by the introduction of the finger in the month and the tickling of the palate. The lymphatic glands of the maxillary space were not swollen. There was no discharge from the nose. The mare ate well and seemed not to suffer from her injury. Her temperature was above the normal and remained so during the whole duration of her sickness, varying between 102° and 103° .

The treatment consisted in the removal of all the loose pieces of bone and the cutting away of those that were adherent to the muscles. The wound was dressed with carbolized dressings.

Every thing went on well, the wound became smaller, the discharge improved, the wound was much reduced in size, the animal fed well, until the 29th, when at my morning visit she was found breathing with difficulty and discharging from the nostrils; the glands had become swollen, and ulcerations had made their appearance on the septum nasi. She was immediately destroyed.

At the post-mortem, besides the lesions of chronic glanders found in the head, the inferior maxillary was found fractured. The injury of the jaw was as follows: A large piece of the maxillary was removed, involving the whole thickness of the maxillary

tuberócity and nearly one-third of the plate of the branch of the bone on that side, the upper portion of the fracture being pushed inwards and extending upwards by a split of the bone towards the corono-condyloid notch.

Case 3.—*CARIES OF THE OCCIPITAL AND ATLAS.*—*POLL EVIL*—*CHRONIC GLANDERS.*—On the 9th of July a bay gelding of 10 years of age, used as a truck horse, was brought to the hospital of the college. He was kept in a stable down-town with a number of other horses, and had never missed his work.

On going out of the stable that morning, it was observed that the head was swollen, the swelling extending down the lips, over the eyes, the parietal region, in the maxillary space, over the poll, and to the axis, where it stopped short. The glands of the maxillary space were quite painful. No cause could be given for that condition, as no local injury could have been inflicted in the stable. His temperature was 102, pulse 50, respiration 16. A dose of physic was given on the 11th, and local applications made to the poll. The animal seemed in great pain. He carried his head low down, bending it from side to side, and showing symptoms of immobility. On the 14th, the abscess of the poll was freely opened on the left side, and yellow, thick pus escaped freely. Through the opening, the middle portion of the external face of the occipital bone could be felt, rough and denuded of periosteum. On the 15th, the temperature was 103, appetite poor, and little cords of a farcinous character made their appearance on each of the cheeks, running parallel to the anterior border of the masseter muscles. The swelling of the lower part of the head had considerably diminished. On the 16th the face had ulcerated in two or three places, and another large abscess had opened on the poll. His appetite remained good. On the 18th, large farcy buds and cords showed themselves on the left side of the neck. A bloody discharge took place from each nostril; one small ulceration was formed on the left side of the septum nasi. On the 19th, all the symptoms of glanders were well defined, and he was destroyed the same day.

The post-mortem of the head showed all the lymphatics filled with small abscesses, and the maxillary ganglions engorged. The

septum nasi on both sides, especially the right, presented the characteristic chancres of chronic glanders, some of them, however, having a more marked acute appearance. The turbinated bones presented also some calcareous deposits, with here and there little ulcerative spots. The occipital bone, on both its external and internal, and the atlas, when boiled, presented beautiful lesions of caries, extending over their external surface.

In neither of these cases was a post-mortem examination made of the respiratory apparatus.

CORRESPONDENCE.

QUESTIONABLE OPERATION.

BY E. MINK, ROCHESTER, N. Y.

Editor of Veterinary Review:—

To-day I read in *The Archives of Comparative Medicine and Surgery*, July number, 1880, pages 168 and 169, the report of cases one and two, diagnosed as fibroid tumors, and found to be such after operations. I noticed that in case one the tumor weighed five and a half pounds, microscopical report not rendered; and further, it is not stated that the interior of said tumor was examined for abscess of inspissated or liquid pus, neither is there any thing said about such examination in case two. Now it occurs to us that it is probable from the history of these cases, that both the tumors were merely walled-in abscesses or fibrous tumors, such as are described by Williams in his "Surgery," on page 397. If so, the operation of removing the entire tumor was wholly unnecessary, and would be practised in such cases only by a novice in the veterinary profession.

Many years ago, and long before we saw even Williams' work, we were called upon to deal with such tumors. In our verdancy, in 1860, we dissected one out located in about the same region as described in case one. It was about the size of a large goose egg. After removing it we examined its interior and found it contained

a small abscess not much larger than an acorn. We then concluded that its entire removal was unnecessary, and that it should have been thoroughly explored first with either needle, trocar or knife, for abscess.

From that time to this, I have been called to treat many such tumors, some quite as large as described in case one, and in every instance where pus could be found by exploring, I have simply cut down upon the deeply walled-in abscesses, liberating the imprisoned pus, and then injecting some stimulant or caustic to destroy the walls of the abscess or to cause adhesive inflammation of the same. And in all these cases (after having been thus treated), I have found these large tumefactions to gradually but surely disappear, proving, as I think, the tumors to consist largely of exuded lymph and hypertrophied tissues.

By excision, important portions of muscular tissue are removed which may ever after interfere with normal muscular action.

By the method of treatment last described, the integrity of muscular tissue is completely restored in a comparatively brief space of time.

Rochester, N. Y., July 20, 1880.

SUICIDE IN A HORSE.

BY W. L. ZUILL, D.V.S.

Editor American Veterinary Review:

DEAR SIR:—Having been requested to make a report of the following case, I beg leave to do so, as I think that the anatomical lesions found on post mortem examination may prove interesting to the readers of the AMERICAN VETERINARY REVIEW. For the want of a more appropriate cognomen, I am inclined to call this case one of suicide, and, although self-inflicted, can not discover that it was in accordance with the will of the animal.

This accident happened on the 27th of April, 1880. The animal was a bay horse, eight years old, the property of Wm. I. Taylor of this city. He had just been fed his usual allowance

of oats, of which he quickly disposed, and then began a vigorous assault on his mate by kicking, which was so effective as to break from the stall a wedge-shaped piece of plank which fell against the animal, frightening him. In his endeavor to rid himself of the nuisance, he caused the sharp point of the broken plank to penetrate the umbilical region of the abdominal parietes a little to the left of the median line, passing upward and forward to a distance of thirty-eight or nine inches and about thirteen inches wide, making a lacerated wound sufficiently large to admit the passage of a man's hand quite easily. The groom not being able to render the animal any assistance alone, ran out for help; on returning found him standing perfectly quiet, the piece of plank having fallen out, followed by the whole mass of small intestines, nearly to the floor. I was immediately called in, and on seeing the case ordered the animal to be relieved of his sufferings, which were being increased by the animal constantly trampling on the intestines, every step bringing down more and more of the abdominal viscera.

On post mortem examination, the small colon was found to be completely severed, and its mesenteric attachment, together with that of the small intestines, entirely destroyed; the whole mass protruding through the wound made through the abdominal walls. The stomach was divided more or less completely, and its contents discharged into the abdominal cavity and from the wound; the liver was somewhat injured, and in the diaphragm a more or less circular lacerated wound about six inches in diameter. On examining the thoracic cavity, considerable damage was found to have been done to the lung tissue on the left side; the thoracic pleura and internal muscles suffered considerably. I was at first surprised at the very slight amount of hemorrhage which had taken place, but afterwards considered the nature of the wound to be sufficient explanation for the case. Hoping not to trespass on your valuable time and space,

I am, yours respectfully,

1513 Race St., Phila.,
July 17th, 1880.

W. L. ZUILL.

AMERICAN VETERINARY REVIEW,

SEPTEMBER, 1880.

ORIGINAL ARTICLES.

REPORT ON DISEASES OF DOMESTIC ANIMALS.

[By JAMES LAW, Professor of Veterinary Medicine in Cornell University.]

Dr. J. L. CABELL :

SIR : In compliance with your request, I respectfully submit the accompanying statement as to how far in my opinion the functions of the National Board of Health must embrace a superintendence of the sanitary condition of the domestic animals. I have considered such animal diseases as determine specific and communicable disorders in man, and have sought to point out in what cases the gravity of the affection would demand the interference of a health board. A large number are mentioned over which a national board of health must exercise a careful supervision if they would fulfil their trust; and to enable them to accomplish this, Congress must give them power to add to their number men who have made a special study of animal diseases, and who are prepared to cope with them successfully. I have further sought to show how essential it is that a board so constituted should be invested with executive power and not left as a mere advisory body, which must lose in intelligence, efficiency, and

esteem in proportion as it is debarred from the practical work of overcoming insanitary conditions and of instituting experiments to determine the best methods of sanitation.

Finally, I have entered on the question of those affections of the domestic animals which are not communicable to man, but are transmissible from animal to animal so as to constitute veritable plagues and to undermine our agricultural prosperity. As agricultural success is the true basis of all national prosperity, the suppression and extinction of these animal plagues is a work only secondary in importance to the arrest of epidemics, as national wealth is only second to moral advancement.

Here arises the question whether a board of health already constituted to deal with a certain number of animal plagues is not the most economical and efficient medium through which to deal with all, and whether the whole subject of animal sanitation should not therefore be placed in the same hands. In seeking to take an impartial view of this matter, I have taken into account the financial interests involved and the necessity for a representation of these in any organization appointed to deal with the subject. I have also considered the great expenditure necessary to a prompt extinction of the exotic animal plagues, and the need of an executive head who can act promptly in every emergency and without the fatal delays that would attend on calling meetings of a health board whose members reside at long distances from each other. Also the vast importance of a speedy extinction of exotic plagues before they can gain a footing on the plains and boundless unfenced pasturages of the West and South, from which it would be hopeless to attempt their extermination. And, finally, the imperative need of prompt and effective work in order that the country may be made aware of the advantages of such an executive, and that there may be no excuse for a temporary—perhaps a final—abolition of the organization before they have had an opportunity to exterminate a single plague, and thereby to demonstrate their value to the nation.

In view of these and other considerations an opinion is respectfully submitted which is, at least, the result of no hurried conclusion, but of careful deliberation.

LIST OF COMMUNICABLE ANIMAL PLAGUES.

As the magnitude and gravity of this subject is but little appreciated, it will be best introduced by stating, in tabular form, the diseases of the domestic animals that are known to be communicable between animals only. Afterward, the question will come up as to which of these diseases will demand the supervision of a health board, and under what circumstances.

A.—*Contagia common to man and animals.*

1. Glanders and farcy in horses, &c.
2. Canine madness, rabies in dogs, cats, &c.
3. Malignant anthrax in all domestic animals.
4. Tuberculosis in all animals.
5. Asiatic (malignant) cholera in all animals.
6. Milk-sickness in cows and other animals.
7. Small-pox in chickens, pigeons, &c.
8. Eczematous (aphthous) fever in bisulcates, &c.
9. Typhoid fever (?) in sucking animals.
10. Diphtheria in animals.

B.—*Parasites common to man and animals.*

1. Echinococcus in animals; Tænia echinococcus in dogs.
2. Cysticercus cellulosa in swine; Tænia solium in man.
3. C. medio-cannellata in calves; T. medio-cannellata in man.
4. C. tenuicollis in man, sheep, &c.; T. marginata in dog.
5. Tænia elliptica in man and cat.
6. Bothriocephalus latus in man, dog, &c.
7. B. cordatus in man, dog, &c.
8. Trichina spiralis in swine, &c.
9. Tricocephalus dispar in man and pig.
10. Strongylos gigas in man, horse, ox and dog.
11. Ascaris mystax in cat and human being.
12. Fasciola hepatica in man, herbivora, and omnivora.
13. Distomum lanceolatum in man, herbivora, and omnivora.
14. Pentastoma tænioides in man, dog, sheep, &c.
15. Sarcoptis mutans in chickens and man.

16. *Demodex folliculorum* in dog, sheep and man.
17. *Æstrus bovis* and other cuticolla in cattle and man.
18. *Gregarina* in man and animals.
19. *Tricophyton tonsurans* in man and animals. (*Tinea tonsurans*.)
20. *Achorion schönleini* in man and animals. (*Tinea favosa*.)
21. *Microsporon adonini* in man and animals. (*Tinea decalvans*.)
22. *Oidium albicans* in man and animals. (Thrush. m. nguet.)

C.—*Contagia communicable from one animal to another.*

1. Texas fever in cattle.
2. Swine plague. Intestinal fever of swine. Hog cholera.
3. Bovine lung plague. Contagious pleuro-pneumonia in cattle.
4. Rinderpest in cattle and other ruminants.
5. Sheep-pox. *Variola ovina*.
6. Swine-pox. *V. suilla*.
7. Cow-pox. Horse-pox.
8. Venereal disease of stallions. Donrine.
9. Foot-rot in sheep.
10. Strangles in horses.
11. Influenza in animals.
12. Infectious mammitis in cows.
13. Parturition fever in ewes.
14. Quebra bunda in horses.
15. Horse sickness of South Africa.

D.—*Parasites causing enzootics in animals.*

1. Scabies acariasis :

- | | | |
|------------|---|--|
| In sheep { | { | Follicular scabies. <i>Demodex folliculorum</i> . |
| | | Scab. { <i>Dermatocoptis ovis</i> . |
| | | { <i>Dermatophagus ovis</i> . |
| | | { Black nose. <i>Sarcoptis ovis</i> . (<i>Leptus Americani</i> ?) |
| In horse { | { | Mange. { <i>Sarcoptis equi</i> . |
| | | { <i>Dermatocoptis equi</i> . |
| | | Poultry mange. <i>Dermanyssus avium</i> , &c. |
| | | Foot mange. <i>Dermatophagus equi</i> . |

- In ox { Mange. *Dermatocoptis bovis*.
Foot mange. *Dermatophagus bovis*.
Poultry mange. *Dermanyssus avium*, &c.
- In pigs and dogs, mange. *Sarcoptis suis* (Squamiferous.)
- In dog { Mange. *Sarcoptis squamiferous* (Suis.)
Follicular mange. *Demodex folliculorum*.
- In cat and rabbit, mange. *Sarcoptis nivar*.
- In chicken, scabies { *Sarcoptis mutans*.
Dermanyssus avium.
2. Lung worms :
- In sheep, goat, and camel { *Strongylus filaria*.
Strongylus filaria, varietas longus.
Strongylus Africana.
- In horse and ox, *Strongylus micrurus*.
In swine, *Strongylus elongatus*.
In birds, gapes. *Sclerostomum syngamus*.
3. *Sclerostomum hypostomum* in sheep.
 4. *Strongylus filicollis* in sheep.
 5. *Strongylus contortus* in sheep and cattle.
 6. *Sclerostomum equinum* in horse.
 7. *S. tetracanthum* in horse.
 8. *S. suis* in swine.
 9. *Tricocephalus affinis* in cattle and sheep.
 10. *Stephanurus dentata* in swine.
 11. *Echinorynchus gigas* in swine, cockroach, ladybug, &c.
 12. *Ascaris suilla* in swine.
 13. *Tænia expansa* in sheep and cattle.
 14. *Cœnurus cerebralis* in sheep, cattle, dogs, &c.
 15. *Cæstrus ovis*, grub in the head, in sheep.

In presenting this formidable list of diseases it must not be supposed that we advocate an immediate resort to suppression of the whole. A very few only will demand prompt and active suppression. For others, even of the most dangerous character, there is only wanted a guardianship over trade, to prevent the importation of disease or its extension into regions where it would

be seriously detrimental. While for most places it will be at long intervals only and in special conditions that the resulting disease will arise to the dignity of an epizootic or epidemic and demand executive interference, yet there are few maladies mentioned above that may not and do not in particular circumstances attain to such dimensions, and a national board of health, charged with the supervision of the sanitary condition of animals as well as men, must be prepared to meet and successfully deal with any one of the above affections to which the human being is subject. Similarly, must an organization, formed to deal with the plagues peculiar to animals, be prepared to deal with any one of those affections when it attains to dangerous proportions.

GLANDERS AND FARCY.

This affection, which so remorselessly ravaged the cavalry regiments and mule trains during the recent American war, was, at the return of peace, scattered widely over the continent. In country districts we continually see it cropping out, and whole studs falling victims to its ravages, while in city car-stables hundreds are not unfrequently slaughtered to arrest the progress of the scourge.

The subjects of the slight and chronic attacks are frequently taken to a distance and sold as sound animals to unsuspecting purchasers, whose health and lives are thus too often sacrificed to the cupidity of an unscrupulous vender; for this terrible malady is as painful, loathsome, and fatal to the human system as to the equine, and every veterinarian of extensive practice can adduce instances in which men have perished miserably from equine infection.

Were it only for the losses inflicted by this scourge, it would demand the prompt destruction and safe disposal of every infected animal.

At the beginning of the present century, horses suffering from chronic glanders were habitually kept and worked in Great Britain, and the losses throughout the island were enormous. Now, where it is illegal to keep a glandered horse, these have been reduced to a very limited number. In the English army, where the presentation of symptoms equivocating glanders entails the prompt

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slaughter of the subject, this disease has been definitely eradicated, and a former loss of ten per cent. per annum has been entirely obviated. When we add to this the moral and economic considerations of the preservation of human health and life, the demand for the instant destruction of animals afflicted with this disease becomes imperative. A statute looking to this end is demanded in all States in which it has not already been enacted, and it becomes the duty of the National Board of Health not only to urge the passage of such a protective law, but to see that it is properly administered. That such a supervision is necessary may be inferred from the facts: 1st. That many of the most dangerous forms of glanders show deposits only in the lungs, testicles, or other distant and deep-seated organs, and these would escape the detection of an ordinary observer, or, indeed, of any one excepting a thorough and accomplished veterinarian, and the subjects of such deposits would be preserved for months or years to spread the disease; 2d. That to extirpate the disease when it has broken out in a stud or locality, it is not enough to dispose of the infected beasts and to thoroughly cleanse and disinfect the premises and movable objects, but this must be followed when requisite by an improvement of the hygienic conditions of the stud, and especially in the matters of ventilation, work, and alimentation. In the case of a disease like glanders, so fatal to both man and horse, the infected horse should be slaughtered as would a venomous reptile, without any consideration of indemnity. The laws under which the destruction is effected should, if possible, be State and municipal, so as to make their administration the especial duty of the local magistrates, but it should be made incumbent on all good citizens to notify such authorities in suspicious cases, and in case of uncertainty as to the true nature of the disease or indisposition to administer the law, the National Board of Health should be the court of appeal empowered to institute an examination and to see that the law is enforced.

CANINE MADNESS, RABIES, HYDROPHOBIA.

In canine madness we confront a disease which even more than glanders demands restrictive measures. The glandered horse is

dangerous mainly to those who voluntarily approach him, and he shows no mischievous propensity to inoculate other animals or man with his dreadful infection. But the rabid dog seems as if the impersonation of evil. Himself suffering from one of the most excruciating and hopeless of diseases, he seeks to fasten his venomous fangs in the flesh of every living creature, as if he took a malignant pleasure in inflicting his own agonies on all within his reach. Nor is this peculiarity confined to the rabid dog. All animals that naturally use their teeth as weapons of offense, when attacked by the violent type of rabies are seized with a similar uncontrollable desire to bite; and as the saliva of the sick is alike virulent in all genera, the danger of the propagation of the malady in this way is very great. The losses from rabies among men and farm animals run far higher than is generally supposed, and are confined to no season, the popular prejudice against the *dog days* to the contrary notwithstanding. In seeking to reduce these or obviate them altogether much is to be done in the way of—first, regulating the keeping of dogs; second, in advice for the private management of dogs by their owners; third, in protection against the free importation of dogs from countries in which rabies abounds; fourth, in acquainting the general public as to the early symptoms of rabies; fifth, in the destruction of all rabid dogs and of all exposed animals that naturally use their teeth as weapons of offense; sixth, in the supervision and frequent examination of exposed animals of genera that do not use the teeth, for a sufficient length of time to insure that no form of the disease, either of a violent or occult type, shall be developed. The destruction of the rabid animal may safely be left to people in the locality, but further precautions would demand the interference of a board of health; hence all cases of rabies should be reported to it, that suitable protective measures may be taken.

MALIGNANT ANTHRAX IN ALL DOMESTIC ANIMALS, AND MALIGNANT
PUSTULE AND INTESTINAL ANTHRAX (MYCOSIS) IN MAN.

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Being enthetic rather than infectious, this malady fortunately rarely attains to the dimensions of a plague, and rarely extends very widely from its true sources of origin. These are mostly in damp lands with a soil rich in decomposing organic matters, and

especially such as have an impervious subsoil, or which, by reason of the basin-like conformation of the locality, has no sufficient drainage. Rich river-bottoms and drying-up marshes, ponds, and lakes, lands that have been overmanured, and those supplied by drinking-water collected from the surface or from strata rich in organic remains, are especially likely to be centers for the reception and preservation of this poison. In such localities, those animals are especially liable to contract the disease which are already in a somewhat morbid condition, excessively plethoric, having the blood charged with hurtful elements, the result of disease, faulty diet, or imperfect elimination, that have had secretions retained or fever developed in connection with hot dry seasons, lack of water, gastric and intestinal impactions, hot close buildings, insolation or excessive alternations of midday heat or midnight cold, and finally those in which from rapid growth or assimilation the tissues are soft, lax, and watery. With such animals, and in such localities, the disease is very liable to appear, and to continue to appear with increasing frequency and fatality, so that such places come to be known as "*dead lots*," and are avoided by all judicious stock-owners. The malady is always confined to limited districts, unless where the above-named conditions extend over a wide territory, as in the rich alluvial steppes of Eastern Europe and Asia, in the plains of India, and in certain of our own rich river-bottoms and prairies. It deserves to be stated that, like malarious fevers in man, this affection has become increasingly frequent throughout the United States in the past few years. While there is a strong probability that the disease is due to microphyte—*bacillus anthracis*—which is found in the blood in all the worst cases, and that certain conditions of the animal system are necessary to cause it to branch out into its special pathogenic development; yet, when its virulency has once been acquired, it maintains this through an indefinite number of generations of the virus, and proves one of the most indestructible of known contagia.

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TUBERCULOSIS IN ANIMALS AND MAN.

It is only since the inoculation experiments of Villemin that the dangers resulting from tuberculous animals have been at all appreciated. To-day after ten years of experimental observations by Villemin, Viscar, Klebs, Zurn, Bollinger, Leisering, Chauveau, Bagg, Semmer, Guenther, Harms, Biffi, Virgad, Gerlach, Buhl, Tilbury Fox, Burden Sanderson, and a host of others, it has been definitely established: 1st, that tuberculosis can be transmitted from animal to animal, from man to animals, and presumably from animals to man, by inoculation, or by the accidental contact of tuberculous matter with a raw or abraded surface; 2d, that raw, tuberculous matter taken from man and animals and eaten by other animals may determine tuberculosis in the latter; 3d, that even the flesh of tuberculous animals will sometimes produce tuberculosis in animals that consume it, though with less certainty than if the tubercle itself were taken; 4th, that the milk of tuberculous animals will at times produce tuberculosis in susceptible subjects, and above all where the morbid deposit has taken place in the udder; 5th, that cooking of the tuberculous matter gives no guarantee of protection, as flesh is a poor conductor of heat, and tubercle that had been boiled from a quarter to half an hour has readily infected a number of animals that partook of it; 6th, that tuberculous matter mixed with water and thrown into the air with an atomizer causes with great regularity the development of the tubercles in the lungs of animals respiring such air. The above conclusions will admit of some qualifications. It may be admitted, for example, that the consumption of the flesh and milk of tuberculous animals is often followed by no perceptible injury. Phthisical cows are often eaten without causing obvious disease in the consumers. I have known large dairies of tuberculous cows, in the hands of vigorous and healthy-looking owners, who consumed the milk freely. I have kept two rabbits consuming *all* the milk of a tuberculous cow for months, and until the latter died without developing any signs of tuberculosis in the rabbits. I have kept other rabbits for two months

on the milk of a cow suffering from acute tubercosis without any appreciable evil result. It may be freely concluded that a large number of individuals while in the enjoyment of robust health will withstand the influence of tubercle taken in the stomach, but it must be otherwise with the weak and young, those with poor feeding and worse air, those living in damp sunless localities, and subjected to much exposure. In a case that recently came under my notice in Brooklyn, N. Y., a family cow was found in an advanced state of tuberculosis, and the owner (William Martin) and his wife were rapidly sinking under the same malady. In another case reported to me by Dr. Corlies, of New Jersey, a family cow supposed to be suffering from lung plague was found to be afflicted with tuberculosis instead, and the owner's wife (a consumptive), who had been making free use of the milk warm from the cow, was persuaded to give it up and underwent an immediate and decided improvement. It is for infants and adults who are somewhat infirm and out of health, or whose surroundings are not of the most salubrious kind, that the danger is greatest, but this embraces such an extended class that the moral interests involved are almost illimitable. The destruction of infancy and wasting of manhood from this cause is unquestionably far greater than has been heretofore realized; and on the moral ground alone this subject demands the watchful attention of a board of health. But even as a financial question, and as estimated in the losses in live stock alone, the subject attains to wide proportions. The infection of tubercle once introduced will often extend from the single diseased animal to a whole herd with startling rapidity. Last winter I visited a herd of sixty Devon cattle that were reported as perfectly sound six years ago. At that time a bull was bought which proved tuberculous, and the disease had steadily increased until at the time of my visit there was not a sound animal on the premises. Into a second herd nine poor calves were introduced in the fall of 1878. They were afflicted with a cough which soon attacked the five other calves on the place, the eight cows, and two cows of a neighbor that pastured with them. At the time of my visit in the spring of 1879 all showed distinct symptoms of tuberculosis.

wherever it threatens to attain a dangerous prevalence.

TUBERCULOSIS IN ANIMALS AND MAN.

It is only since the inoculation experiments of Villemin that the dangers resulting from tuberculous animals have been at all appreciated. To-day after ten years of experimental observations by Villemin, Viscar, Klebs, Zurn, Bollinger, Leisering, Chauveau, Bagg, Semmer, Guenther, Harms, Biffi, Virgad, Gerlach, Buhl, Tilbury Fox, Burden Sanderson, and a host of others, it has been definitely established: 1st, that tuberculosis can be transmitted from animal to animal, from man to animals, and presumably from animals to man, by inoculation, or by the accidental contact of tuberculous matter with a raw or abraded surface; 2d, that raw, tuberculous matter taken from man and animals and eaten by other animals may determine tuberculosis in the latter; 3d, that even the flesh of tuberculous animals will sometimes produce tuberculosis in animals that consume it, though with less certainty than if the tubercle itself were taken; 4th, that the milk of tuberculous animals will at times produce tuberculosis in susceptible subjects, and above all where the morbid deposit has taken place in the udder; 5th, that cooking of the tuberculous matter gives no guarantee of protection, as flesh is a poor conductor of heat, and tubercle that had been boiled from a quarter to half an hour has readily infected a number of animals that partook of it; 6th, that tuberculous matter mixed with water and thrown into the air with an atomizer causes with great regularity the development of the tubercles in the lungs of animals respiring such air. The above conclusions will admit of some qualifications. It may be admitted, for example, that the consumption of the flesh and milk of tuberculous animals is often followed by no perceptible injury. Phthisical cows are often eaten without causing obvious disease in the consumers. I have known large dairies of tuberculous cows, in the hands of vigorous and healthy-looking owners, who consumed the milk freely. I have kept two rabbits consuming *all* the milk of a tuberculous cow for months, and until the latter died without developing any signs of tuberculosis in the rabbits. I have kept other rabbits for two months

on the milk of a cow suffering from acute tubercle without any appreciable evil result. It may be freely concluded that a large number of individuals while in the enjoyment of robust health will withstand the influence of tubercle taken in the stomach, but it must be otherwise with the weak and young, those with poor feeding and worse air, those living in damp sunless localities, and subjected to much exposure. In a case that recently came under my notice in Brooklyn, N. Y., a family cow was found in an advanced state of tuberculosis, and the owner (William Martin) and his wife were rapidly sinking under the same malady. In another case reported to me by Dr. Corlies, of New Jersey, a family cow supposed to be suffering from lung plague was found to be afflicted with tubercle instead, and the owner's wife (a consumptive), who had been making free use of the milk warm from the cow, was persuaded to give it up and underwent an immediate and decided improvement. It is for infants and adults who are somewhat infirm and out of health, or whose surroundings are not of the most salubrious kind, that the danger is greatest, but this embraces such an extended class that the moral interests involved are almost illimitable. The destruction of infancy and wasting of manhood from this cause is unquestionably far greater than has been heretofore realized; and on the moral ground alone this subject demands the watchful attention of a board of health. But even as a financial question, and as estimated in the losses in live stock alone, the subject attains to wide proportions. The infection of tubercle once introduced will often extend from the single diseased animal to a whole herd with startling rapidity. Last winter I visited a herd of sixty Devon cattle that were reported as perfectly sound six years ago. At that time a bull was bought which proved tuberculous, and the disease had steadily increased until at the time of my visit there was not a sound animal on the premises. Into a second herd nine poor calves were introduced in the fall of 1878. They were afflicted with a cough which soon attacked the five other calves on the place, the eight cows, and two cows of a neighbor that pastured with them. At the time of my visit in the spring of 1879 all showed distinct symptoms of tuberculosis.

These may be thought to be extreme cases, but I am acquainted with districts in which 30 per cent. of the cattle suffer from tuberculosis, and with many high priced herds in which this scourge yearly claims its victims. In his experiments Professor Gerlach had to utterly discard certain strains of high-bred swine, because of the astonishing frequency of tuberculosis in these subjects.

This disease opens up an extensive field for sanitary work, and particularly in the neighborhood of large cities, where so many infants, subjected to all the depressing influences of city life, are sustained by the milk of cows kept in unwholesome stables and fed so as to secure the greatest possible yield of milk, irrespective of results. Here the environment of the cows that yield the milk and that of the children who consume it are altogether favorable to tubercule, and the subject requires the most careful supervision of the sanitary authorities.

The great mass of the adult city population is only a degree better in this respect than the infants; and as the cattle that are no longer useful for milk are too often made into beef, or rather sausages, the children of a larger growth are confronted with the risk of tuberculous meat as well as infected milk. The same dangers attend on the country districts, and though they are to some extent counteracted by pure air and better surroundings, yet the taint, if once introduced into a herd, tends to undergo a steady increase, until, as in the case of the country herds I have referred to above, all fall under its baleful influence. Then, again, in most of our large cities the cows are not kept over one season, but are constantly being replaced by fresh ones from the country; and it is only by purifying the source of the trade that we can secure sound cows in the cities.

That a supervision and restriction of tuberculosis is demanded cannot for a moment be gainsaid; but in view of the enormous proportions of such a work and the great monetary interests involved, together with the recent data of all exact observations on the transmissibility of the contagion and the different results obtained in different cases, it would be well, before proceeding far in this matter, to conduct a series of experiments which would tend to determine more accurately the conditions in which the

different products are virulent and the circumstances in which exposed animals are susceptible. The proper supervision of this affection will demand the most careful consideration of the soundest and most enlightened minds. It would demand—first, the enforcement of a series of sanitary rules for the construction and management of city and suburban cow-stables, embracing the sites, exposure, drainage, space per animal, ventilation, water supply, food, cleanliness, &c.; second, a professional inspection of the cow stables to insure that no cow with active tuberculosis is kept for the supply of milk, and no bull for the propagation of his kind; third, a professional inspection of the slaughter-houses and poulterers' to see that no flesh or other products from dangerously tuberculous animals are allowed to pass into consumption as human food. As far as possible a sanitary control should be established over country herds as well, and means should be taken to extirpate the disease and remove its causes in the many districts in which the affection has become domiciled as an enzootic.

MALIGNANT (ASIATIC) CHOLERA.

With the threatened approach of a new visitation of cholera the National Board of Health must apply to the lower animals all those precautions which have proved beneficial in warding off this scourge from the human race. In this connection it need only be stated that Annesley, Jamieson, and many other Indian physicians testify that during cholera epidemics the domestic quadrupeds often showed a greater mortality than man, and that poultry yards were utterly depopulated by the scourge; that Hildebrandt, Hering, Dick, Reynal, and others record the ravages of this plague simultaneously in man and animals in Europe; and that Burden Sanderson and others have produced the disease experimentally in the rodents by feeding paper dipped in the virulent alvine discharges of men. It has often been noticed that birds disappeared during the cholera epidemics, the rational explanation being that they perish. This will especially demand the careful seclusion of all animals in cholera districts; the destruction, if necessary, of wild animals; the disinfection of all bowel dejections and of the carcasses of animals dying of the plague, as

well as of the places and loose objects where the sick have been ; and, lastly, the most careful attention to prevent further infection through fodder, litter, or other solids, and through surface or underground drainage, natural or artificial, into wells or streams, into contact with the food of men or animals or the places where animals resort to lick the soil. It is evident that no system of protection can be effective that fails to recognize that the lower animals transmit this virus as well as suffer its consequences.

MILK SICKNESS. THE TREMBLES.

The great importance of this disease has failed to be recognized, mainly because its source is to be found in certain backwoods districts rarely penetrated by those who preside over our medical literature, and because it gradually recedes before the advance of improved agriculture. Many medical men indeed express grave doubts as to its very existence. Yet the history of the malady is so circumstantial and clear that a doubt as to its specific nature is eminently disingenuous. In its source in unimproved marshy localities it closely resembles the malignant anthrax, also in its communicability to all animals, but it differs essentially in that it fails to show local anthrax lesions, in place of which it expends its energy on the nerve centres, producing great hebetude and loss of muscular power. According to Dr. Phillips, it is characterized by the presence in the blood of a microzym (spirillum), like that seen in relapsing fever. The germ is probably derived from the drinking-water or the surfaces of vegetables, as certain wells are found to infect with certainty, and the disease has been repeatedly produced by feeding upon particular plants (*Rhus toxicodendron*, &c.). That these plants in themselves are not the pathogenic elements, is shown by their innocuous properties when grown in places out of the region of the milk-sickness infection. It seems altogether probable that here, as in malignant anthrax, we are dealing with a microzym which has developed pathogenic properties and which can be reproduced indefinitely in the bodies of living animals. The great danger of this affection consists in the conveyance of the germ with unimpaired potency through the flesh and milk and through the man-

ufactured products of the latter—butter and cheese. Some even hold that in animals giving milk the system does not suffer materially, but that it is saved by the drainage of the germs through the mammary glands, and that thus a milk-sick cow may remain for a considerable time unsuspected, while her milk, butter, and cheese are conveying mental and physical decay and death to many human beings, near and remote. For the disorder proves as fatal in man as in animals, and if in particular cases it fails to destroy life, it usually leaves the subject in a condition of hebetude and physical weakness that makes life miserable.

The permanence of the germ in butter and cheese renders inevitable the conclusion of physicians in milk-sick districts, that cases of this disease must be frequent in city populations, but that its true nature is not recognised by the medical attendants. The whole subject demands a thorough experimental investigation at the hands of the National Board of Health, so that the true source and germ of the malady may be discovered, if possible, and that in any case intelligent measures may be taken to prevent its conveyance out of its native habitat.

SMALL-POX IN BIRDS.

In Europe and Hindostan variola is so common in pigeons and poultry as to constitute a veritable plague. Thus Guersent records that out of a dovecote of 1,000 scarce 100 could be found that did not bear marks of the disease, while Tytler says the poultry-yards in India were habitually depopulated by the plague. Bechstein and others claim that this is the true small-pox derived from the human being and conveyable back to man, while others, like Toggia and Gilbert, assert that it is communicable to the sheep. That this affection has not been recognized among us may be due to a difference in the environment which modifies the infection, or, perhaps, to the fact that men and pigeons do not live so much in common here as in Italy and India. Such an occurrence under Italian skies should, however, demand a careful investigation into the reality of such infection in our own States, and especially the Southern ones, during the prevalence of an epidemic of small-pox, so that whatever danger arises from this source may be detected and guarded against.

ECZEMATOUS (APHTHOUS) FEVER IN ANIMALS.

Although this disease is communicable to man in a mild form, and to infants who live on the fresh milk in the form of a violent and even fatal inflammation, yet, as it has at present no foothold on this continent, and, like rinderpest, sheep-pox, dourine, quebra bunda, &c., may be easily excluded by inspection and quarantine at our ports, it will be best to leave it with the purely animal plagues to the control of a veterinary sanitary bureau, and thus avoid the multiplying of inspectors.

TYPHOID FEVER IN SUCKING CALVES.

Reports have lately been published of the occurrence of this disease in calves, and of the infection of a number of persons that have eaten of the veal; it seems very desirable, therefore, that experiments should be instituted to ascertain whether animals kept on an exclusively milk diet are susceptible to this infection of man. It seems altogether probable that a mistake has been made and that the calves and their victims died of trichiniasis, intestinal anthrax, or of some other poison common to man and animals; but it should at least be shown by the National Health Board that the danger of the alleged transmission of typhoid fever is altogether fanciful.

TRICHINIASIS.

The life-history of the trichina spiralis is now fairly understood. The parasite is harbored by very many mammalia and probably even by reptiles, but is, above all, common in rats, pigs, and men. It has its two principal stages of existence—the *sexually mature* form, which lives and propagates its kind in the intestines only, and the *immature asexual* form, which, born in the intestines, bores its way through their walls and into the voluntary muscles, where it encysts itself. These last attain maturity only when their host is devoured by a carnivorous animal, and when the cyst is digested off so as to set the imprisoned trichina free. A third habitat may be named for those embryos that have been carried out of the system by the prevailing diarrhœa ere they have

had time to penetrate the intestinal walls and seek an asylum in the solid tissues. These can live for an indefinite length of time in pools of water without undergoing further development, until they are taken in by a mammalian host, when they penetrate the intestinal walls and encyst themselves in the muscles.

All this has been known for many years, but sanitation has advanced no further than to advise the microscopical examination of all pork, to enjoin that it be thoroughly smoked or well cooked before it is eaten, and to utter a warning against keeping pigs about slaughter-houses and feeding them on the raw waste products. Meanwhile, our pork hams have been, rightly or wrongly, acquiring a most undesirable reputation. Dr. Belfield and Mr. Atwood, of Chicago, pronounce 8 per cent. of the hogs killed in that city to be trichinous, and several European countries have forbidden the importation of American hams. In Germany, on the other hand, where all pork is subjected to microscopic examination, the statistics show that trichina have been found in but one of 2,000 hogs examined.

The protection of our population against this tremendous scourge, and of our market against the embargoes of frightened Europeans, demands a system which shall reach further and prove more thorough. The feeding of pigs on any flesh that is not thoroughly cooked should be strictly prohibited, a trichina inspector should be made to examine all pork exposed for sale, in cities especially, and any discovery of trichinous pork, whether from such inspections or from the occurrence of the disease in man, should lead to such inquiries as would in all possible cases discover the source of such pork, and then should follow the destruction and prolonged boilings of all hogs, dogs, cats, rats, mice, snakes, and other carnivorous animals on the premises, the burning of the hog-pens and manure and the closure of the yards against hogs for one year; also, the shutting up of all wells or other collections of water to which the swine may have had access or into which drainage from the pens could have taken place.

Further, examination should be made in such localities of all animals, vertebrate and invertebrate, that the hogs could be

expected to have devoured. Under such a system not only may we hope for a material decrease of trichinous hams and bacon, but for valuable discoveries of hitherto unsuspected and dangerous hosts of parasites, so that the work of extermination would continually become more easy and effectual.

ECHINOCOCCUS.

In all countries where it abounds (Iceland) this is one of the most destructive of the parasites of man. In the United States it is by no means so common as to give rise to much apprehension, and yet an examination of the internal organs of animals slaughtered, and a consultation of medical records, show that it is far from uncommon. As the parasite is derived from the dog, and as its *tænia* form in the bowels of that animal is so small as to be rarely recognized, it is likely to cause great damage before its presence is suspected in a locality. This is but one of a myriad of heavy charges that must be brought against the crowds of useless curs that everywhere abound, and more or less directly impair the health and prosperity of the people. With man alone the dog reciprocates in sustaining no less than seven dangerous animal parasites, in addition to the vegetable ones, producing the different forms of ringworm; with cattle and sheep he joins in maintaining three that devastate our herds and flocks. His ubiquity is a continual threat of canine madness to all living things. He has remanded to nature, or to less productive culture, large tracts that are admirably adapted to the raising of sheep, but where the losses from the devouring jaws of the dog have rendered sheep farming unprofitable. Sanitary considerations, alike affecting man and beast, therefore demand a rigid control of dogs and the imposition of a tax that shall be to a large extent prohibitory of their maintenance. Further, whenever *echinococcus*, *eysticercus tennicollis*, *Bothriocephalus latus*, *B. eordatus*, *Strongylus gigas*, *Pentastoma tænioides*, or *Demodex folliculorum* occur in man, attention should be given to the condition of the dogs in the locality, and measures taken to prevent the propagation of these parasites through their systems.

OTHER PARASITES.

To go over the other parasites which are common to man and animals would serve no good purpose. They rarely attain to the gravity of an epidemic, and will only demand sanitary interference in very exceptional circumstances; yet the Board of Health must be so constituted that it can effectually deal with any of these in such an emergency. For this, a veterinary sanitary committee will be always prepared, and will act mainly as an advisory body; but also, when necessary, in an executive capacity. Thus, an influx of measly pork should demand that it be traced to its source, and that its source, the tapeworm of man (*T. solium*), should be destroyed, while all pigs should be forbidden the infected ground for over a year. An influx of measly veal should demand a similar correction, and thus dangers of a material increase of either of these parasites will be done away with. In fishing localities where the *Bothriocephalus latus* or *B. cordatus* gains a wide diffusion, it may become necessary to keep all dogs under the closest surveillance and to periodically rid them of the parasite. It might further become needful to control the consumption of certain fish, or of fish-eating mammals likely to be devoured by dogs. The prevalence of *Sarcoptes mutans* (scabies) in chickens may become so great that it will entail a most inveterate itch in man, the true source of which is seldom discovered. Again, gregarina have lately been found in the lungs of chickens, and in the bowels of pigs, and it seems quite within the bounds of probability that as they live on the hairs of man, so they may at times infest his internal organs.

For the above reasons it is desirable that Congress should provide for the incorporation with the National Board of Health of one or more veterinarians, whose functions it would be to consult with the present members in all matters in which the health of the lower animals affects that of man; to advise as to the enactment and administration of State laws for the prevention and extinction of plagues and parasites common to man and animals; to conduct experimental researches into the source, propagation, and extinction of these disorders and parasites of animals, and to act when necessary in an executive capacity in the

exclusion or control of these scourges. To carry out these objects Congress should be asked to appropriate a sum of money, to be expended, as may be seen to be best, in experiments, in investigations, and in the control of these epidemics and epizootics.

PLAGUES AND PARASITES PECULIAR TO THE LOWER ANIMALS.

In turning now to the communicable disorders of the lower animals to which man shows no susceptibility, we face a much more extended class. No less than thirteen different forms of contagia and thirty-four different parasites exist, any of which may induce a prevalence that rises to the dignity of a plague. Among the contagia given in our list the majority are probably indigenous to our soil, while four are certainly exotic. Of the latter but one (lung plague of cattle) is known to exist at present in the United States, but that one more imperatively demands instant and effective action than all our plagues of home birth. Arising in this country from contagia only and having an excessive incubation period (one to three months), it can be spread with the greatest facility by animals that carry the seeds of the malady but have not yet developed the disease. Having a constant tendency to the death of tissue and to the encystment of this as a mass (infecting material), which remains unchanged for many months in the chests of animals that are thought to have recovered, it is ever liable to be spread by the apparently convalescent. Add to this that this contagion, if once carried to our Western and Southern stock-ranges, could never be eradicated, but must remain as a permanent incubus and scourge as it has on the steppes of Russia, the open lands of Australia, and the unfenced ranges of Southern Africa, and we see reason why a prompt attention should be given to its speedy extermination. If more is wanted to enforce this, it is the calculation (based on the European losses from this plague and the steady increase of our own herds of cattle) that this pestilence, left to itself and extended to our Western stock-ranges, will probably lay us under a tax of \$130,000,000 per annum. But the flesh of animals attacked with this plague has never been shown to be injurious to man, and thus the question of its extinction is an exclusively pecuniary

one and demands the action of the stock-owner rather than the sanitarian. While the necessary steps to insure the extinction of this and allied plagues are sufficiently well known to the veterinary profession, and while effectiveness and promptitude are best secured by placing the matter in the hands of one executive head, yet it will better command the confidence of the stock-owners and indirectly of Congress, if one or two representative stockmen are officially connected with the work.

While on purely professional matters the veterinarian must of course decide, and in the execution of the work which is essentially professional he should direct, yet in many subjects connected with cattle-raising and the peculiarities of the trade in different parts of the country the knowledge and experience of the stockman will be of inestimable advantage in arriving at safe and effective local enactments that will not unnecessarily harrass or hamper trade on the one hand, nor be easily evaded on the other. A small committee or bureau of this kind, clothed with executive authority and with financial means equivalent to the end, could make much more effective work than could a committee of the Board of Health, who could not get together to meet every emergency. Again, the first part of this sanitary work must be done as speedily as possible because of the great and increasing dangers that attend upon delay, and to secure this it will be necessary to appropriate a large sum of money to enable the executive to carry it on with uninterrupted energy to the end, since any suspension for lack of funds would entail the renewed spread of the disease and the loss of all that had been already expended. This consideration is a vital one, and of itself would decide me in favor of a separate executive, for the exclusively animal plagues, to be furnished with abundant means and full administrative power. A supplementary appropriation to the Board of Health, which might be largely used up for what at the moment and as viewed from a moral standpoint might appear as a more urgent demand, would be hurtful to both human and veterinary sanitation. If, for example, the work of exterminating the cattle lung plague had to be entirely arrested for want of means, it would soon again extend over the ground

which it had lost, all that had been expended on it would be forfeited, and there would be much less likelihood of a speedy resumption of the work. If even the work were only retarded for lack of means, as has been the case in New York for the past three months, if the executive could only quarantine infected herds and partially control the movement of cattle, but could not kill the sick for want of means to indemnify the owners for their losses, a most hurtful blow would be dealt to the entire system of national sanitary legislation and administration. In either case the most prominent fact before Congress and the people would be that so many hundred thousand dollars had been expended for the extinction of a plague which, when the next appropriation was requested, either prevailed as widely as at first or was only appreciably less prevalent. All representations that the want of success had been due to the lack of means would receive little attention; the community would conclude it better to squander no more money on the matter; all further veterinary sanitary legislation would probably be rendered hopeless; no small amount of opprobrium would be thrown on the National Board of Health itself, and a severe blow would be dealt to all national health legislation.

It is especially fortunate that, by reason of the active measures carried out in the first six months of our work in New York, we can now point to seven counties virtually cleared of the pestilence, and by later restricting our work to controlling movement of cattle, we have been able to prevent any renewed extension of the pest; yet with a little more means New York might have been to-day all but clear of this scourge.

The time may come when the nation will be sufficiently educated to allow the sanitation of man and animals to be controlled by a single National Health Board; but at present, and for the exclusively animal plagues, we cannot afford to run any risk, and that method should be followed which will secure a certain and speedy result, and establish the principle of the extinction of such pestilences on a sound and unassailable basis. I would therefore urge as the result of mature deliberation, in view of all aspects of the question, that the control of these

animal contagia and parasites which affect man as well should be placed in the hands of a veterinary committee of the National Board of Health organized for that purpose, while the exclusively animal plagues and the parasites that affect animals only should be committed to an organization drawn from the stock-owners and the veterinary profession, and not too large or unwieldy for the most prompt and effective action.

I consider it needless to encumber this statement by any further reference to the other animal plagues and parasites, as I would not recommend *immediate* executive action for more than the other in addition to the bovine lung-plague. Besides this, the work of the special veterinary organization would consist mainly in controlling the imports of live stock and in advising as to the management of local epizootics which did not immediately threaten the nation at large.

EDITORIAL.

The effects of the embargo placed upon the importation of American live-stock by the English Government, the difficulties and embarrassments to which it has subjected our exporters, and also the heavy losses which our agriculture must have sustained, have, no doubt, induced our Government to endeavor to have the restrictions, if not entirely removed, at least to some extent relieved. With that object in view, such powerful influences have been brought to bear, that the subject has been introduced in the House of Commons, and action in the matter applied for.

The news that reached us of the attempt made is accompanied by intelligence of the failure which befell the effort.

This is hardly an unexpected result, for after all, being as we are, without veterinary sanitary organization on the one hand, and on the other, standing so much in need of it, by reason of the presence of contagious diseases amongst our stock, it was scarcely to be hoped that our adventure in this direction would be crowned with immediate success.

We are unable, at present, to give any detailed or official information on the subject, but have no doubt that the whole question will be laid before our readers upon the return of our esteemed friend, Dr. C. P. Lyman, from his mission to England.

We are pleased, however, to be able to say that the effect of this failure is already appreciated by the American Government. One of our correspondents informs us that Gen. Patrick, already so well known by his labors in connection with the investigation of Texas fever, and lately as associated with the New York Commission on Contagious Pleuro-Pneumonia, has been requested by the Secretary of State to indicate a suitable site for a quarantine establishment on the shore of New Jersey, at Sandy Hook.

This is already quite an important step in the right direction, which, though it seems only to refer to precautionary measures on this part of the country, still indicates a desire, on our part, to take proper measures to convince foreign Governments that we are appreciating, though somewhat tardily, the necessity for the establishment of sanitary regulations.

REPORT ON DISEASES OF DOMESTIC ANIMALS.

At the period of the organization of the National Board of Health, and when it was hoped that veterinary science might be represented in the Board, requests were made by Dr. Cabell, President of that body, to a number of veterinarians, for reports on the diseases of animals as they exist in this country, and upon their influence on the general health of the community. A number of these were doubtless received by Dr. C., and in one of our exchanges, the *Bulletin of the National Board of Health*, we find the paper sent by Prof. Law. We reprint this paper for the benefit of our readers, many of whom may not have had an opportunity of seeing it before, and to whom it will, doubtless, prove interesting.

HUMAN AND ANIMAL VAROLÆ: A STUDY IN COMPARATIVE PATHOLOGY.

BY GEORGE FLEMING, F.R.C.V.S., ARMY VETERINARY INSPECTOR.

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(Continued from p. 199.)

What we might call the *casual evidence* as to the non-identity between human variola and cow-pox, and their being two distinct diseases of a group, is still further increased by other facts which may be mentioned. The individuality of contagious maladies is, perhaps, never more strongly marked than when we find the two affecting the same person or animal, and running their course concurrently, the various phases of one being passed through entirely independently of the evolution of the other. Such instances are far from infrequent in the practice of the physician and veterinary surgeon, and from my own experience I could relate several. But I refrain from doing so, as additional testimony of this kind is not required at this period of the nineteenth century, I hope. But in the discussion now undergoing consideration, such evidence should be borne in mind when we mention the fact, that cases are recorded in which people already infected with small-pox, and who had been vaccinated when so infected, have had the eruptions of the two diseases apparent at the same time, each preserving its special characters, undergoing its different changes, and terminating exactly as if it were totally independent of the other, and had not the slightest influence in modifying or checking its course. And more than this, Hallé is reported to have employed the lymph from the vaccine vesicles developed under these conditions, to vaccinate healthy children, and has only produced the pock of vaccinia—never small-pox. In one of Chauveau's experiments, in which a horse was inoculated with the virus of human small-pox, which gave rise to local effects, and was also inoculated with vaccine lymph, evidence of the two morbid actions operating coincidently was undeniable,

and afforded one more proof that a certain lapse of time must ensue before the preservative influence of vaccine comes into play.

However strong and abundant clinical and casual evidence may be, it is not always completely convincing, unless supported by experimental demonstration, when it is then irresistible. This evidence is also fortunately at hand, and in a most exhaustive and complete form; and it is very remarkable that, with the exception of one speaker at the conference (Dr. Cameron), its existence does not seem to have been known to those present; at least, this may be inferred from the circumstance that it was never alluded to, save in the one instance mentioned. That my surmise is not very wide of the truth, may be taken for granted, when we read of one gentleman saying, in reference to the experiments conducted by my friend, Professor Chauveau, of the Lyons Veterinary School, and briefly summarised by Dr. Cameron, that "it seemed strange that men should, at the present time, go abroad to France, to the futile and speculative experiments of a Frenchman, and take possession of the inferences he entertained." Such language betokens either ignorance of, or an utter failure to appreciate, the value of the results of these experiments; but then this speaker asserted that he had successfully inoculated a large number of cows with small-pox virus, and produced vaccinia which gave him abundant vaccine lymph.

In France, as in some other European countries, the origin of cow-pox had long been a fruitful subject for discussion and speculation and more than once it had provoked warm debates at the Paris Academy of Medicine. In 1863, M. Bouley, then director of the Alfort Veterinary School, had re-discovered at Paris the "horse-pox" of Dr. Loy, of Pickering—in reality, the "grease" of Jenner, Sacco, and others, who believed in the equine origin of cow-pox. But M. Depaul, who had also, with Bouley, studied this *vaccinogenous* disease of the horse, was inclined to follow the example of Baron and his followers, and to conclude that it and other eruptive disorders occurring in animals, and possessing analogous characters, were nothing more or less than human variola. So it was that he included sheep-pox, and the aphthous

disorder of animals known as foot-and-mouth disease, in the list of disorders having their common source in small-pox. The influence which he and Bouley possessed divided the Academy into two camps, and the result was recourse to experimentation, which happily led to the conclusion that this equine eruption was capable of producing cow-pox in the cow and vaccinia in mankind. But the burning question as to the identity of small-pox and the diverse varioliform affections of animals remained as undecided as before; no new facts of a reliable kind were brought forward, and there was nothing to talk about save the well-known contradictory circumstances which had been so often alluded to before, but which were again brought into debate with all the oratorical ability and scientific ardour for which that renowned body is remarkable. Viewing it as a purely experimental matter, as a question which could only be decided by true facts, the Society of Medical Sciences of Lyons appointed a commission to carry out this inquiry. The commission was composed of Drs. Boudet, Delore, Dupuis, Gailleton, Horand, Lortet, Meynet, and Viennois, and the veterinary professor Chauveau. The latter was the president of the commission, and on him chiefly devolved the task of experimenting on the animals. A man more competent for the onerous duty imposed upon him could not be found in Europe; his reputation in the world of medical science stands very high as a most accomplished physiologist and experimental pathologist, the result of whose experiments may be received as absolutely trustworthy. Drs. Viennois and Maynet were secretaries, and the three drew up the final report, which was presented in 1865. On March 5th, 1866, the French Academy of Science awarded the Montyon prize, value 2,500 francs, to Chauveau and his two colleagues, Viennois and Maynet, and gave honorable mention to the other members of the commission. This award was made on the recommendation of a commission appointed by the Academy, and constituted by such men as Claude Bernard, Serres, Velpéau, Cloquet, Joubert, Flourens, Rayer, Milne Edwards, and Longet, who gave their opinion as to the great interest and value of the Lyons investigations. This commission, aware that the medical profession had been divided in opinion as to whether, if

human variola were inoculated on the cow, it could be so modified as to produce true primary vaccinia, or whether variola was so foreign to the bovine species that its inoculation in cattle was impossible, alludes to the ability of Chauveau, and to the results of his labours, which demonstrated that the truth lay on neither side. These results proved that human variola could be inoculated on the cow and horse with the same certainty as vaccinia; but they also showed, contrary to what takes place in the human subject, that the primary effects produced by inoculation with the two viruses were absolutely different. Thus, with the ox, the small-pox virus only determines a local eruption of papules, often so small that they would pass unperceived if one were not warned of their existence. Hence the mistake made by some experimenters, who have denied that small-pox could be inoculated on bovines. The vaccine virus, on the other hand, engenders the typical pustular eruption, with its large characteristic *boutons*.

Analogous differences are observed, continue the Academy commissioners, on animals of the equine species. These differences are still more manifest in the same animal inoculated simultaneously with the two viruses; the two eruptions are then developed simultaneously without appearing to influence each other, and preserve their special characters. But the two viruses are not less capable of acting one on the other, and so reciprocally neutralising each other—just as in man—when inoculated successively on the same animal. In fact, human small-pox generally fails on vaccinated animals, while the vaccine virus as commonly fails on those which have been previously submitted to variolous inoculation. In no case had Chauveau and his colleagues seen the slightest tendency to *rapprochement* between the characters of the two eruptions in the horse and ox. In attempting to cultivate the variolic virus on these two species, they have even discovered that it cannot become acclimatised in them, and that, with the ox in particular, it becomes impotent at the second or third generation; while the vaccine disease is propagated indefinitely from one individual to another. With regard to inoculation of man with this variolic virus which had been transiently (*passagèrement*) implanted in the organism of animals,

this only engenders small-pox, neither more nor less, just as does the variolous virus obtained direct from the human species. The eruption is sometimes discrete and benignant, sometimes confluent and serious—at times normal, at other times abnormal. But in all cases the disease preserves its property of infecting healthy individuals by miasmatic contagion (infection); and its virus, even when taken from an almost absolutely local eruption, never gives more, in bovine animals, than the papular eruption which ordinary human variola produces in these creatures.

The Academy of Sciences commissioners conclude their verdict as follows:—"The experiments, the results of which have been just mentioned—experiments as remarkable by their number as by their distinctness (*netteté*) and concordance—appear, therefore, proper to solve the debatable points in view of which they were instituted. In establishing that vaccinia and variola, notwithstanding the features which assimilate them in animals as in man, are, nevertheless, totally independent of each other; that their viruses form two distinct individualities; that the two affections thus constitute two different, immutable species, which cannot be transformed one into the other; that, consequently, to seek to produce vaccinia from variola would be to pursue a dangerous chimera, which would revive all the dangers of inoculation of by-gone days—in establishing facts of such great importance, the experiments directed by M. Chauveau have rendered an incontestable service to science and to medical practice."

Such was the opinion expressed by the representatives of the Academy of Sciences with regard to the Lyons experiments, and after reading the account of them, and knowing well the very trustworthy character and great professional ability of M. Chauveau, I think no doubt whatever can be entertained as to the justness of that opinion. And, besides, it must be remembered that an Italian medical commission, which carried on similar experiments and investigations at Turin, from 1871 to 1874, came to the same conclusion that Chauveau did—that human small-pox cannot be converted into cow-pox when the virus is transferred to bovines, but always preserves its original character.

The advantage and opportunities the Lyons commission could avail themselves of were very great. The magnificent veterinary school of that city was placed at their disposal, with as many horses as they required for experiment, as well as lodging and food for the other numerous animals they employed in their investigations. The 160 cows and bulls, and 40 pigs, at the Imperial Agricultural School of Saulsaie, were at their service; as well as about 100 cows and numerous sheep and goats at a large farm near Lyons. For experiments on the human species, the *service des vaccinations* as the Hôpital de la Charité, presided over by Drs. Berne and Delore, as well as a member of the commission—M. Horand—was made available. The experiments were conducted with the greatest care and deliberation, and were very numerous; the observations on them were drawn up by Dr. Horand. They were divided into two orders or sets; one order of experiments with vaccine virus, another with that of human small-pox. Each of these again was arranged in series, and each experiment in the series is described in detail in the report.

The variola experiments are those which have most interest and importance for us, so far as the identity of small-pox and vaccination are concerned; though those with vaccinia have a more or less direct bearing on these, as well as on animal vaccination. More especially is it necessary to refer to the results of the first group, in order to refute the statement made at the London conference, that the small-pox matter was merely deposited in a little pouch in the cow's skin, and then re-transferred to the human subject, to whom it gave small-pox. Quite cognisant of what had already been achieved in this direction, the greatest circumspection was observed in guarding against fallacious conclusions; and the perfect knowledge possessed by Chauveau of the nature and habits of animals, their structure and diseases, as well as of experimental methods, was certainly an advantage of which few, if any, previous investigators could boast.

In order to study variola inoculated on the bovine species, twelve animals were selected which were known not to have had cow-pox. Of these, nine were cow or bull-calves, two were recently-calved milch cows, and one a six-year-old pregnant cow.

They were all inoculated with small-pox matter, between December and April, the material being obtained from four people who were affected with small-pox, and who had never been vaccinated; it was always employed very fresh. The inoculations were made at the vulva in the females, and perineum and scrotum in the males, and exactly in the same way as in vaccinating—the punctures being sometimes subepidermic, at other times quite subcutaneous. In none of the animals were there observed the slightest general phenomena—no disseminated eruption, fever, loss of appetite, or diminution of the lacteal secretion. With regard to the local phenomena, they were so trifling that in a first series of experiments they were inappreciable; hence the error of some of the preceding experimenters, who conclude that cattle could not be successfully inoculated with Small-pox virus. But other experiments prove this to be a fallacy; and a drawing accompanying the report shows the perineal region of a bull-calf, and on the left side of which five sub-epidermic variolous inoculations had been made, and the effect of which had arrived at its *summum* of development. There were small, red, slightly-prominent papules, from two to four millimeters in diameter, and slightly conical, in the centre of which the inoculation-puncture could be distinguished. These papules commenced to develop on the second day, and on the fifth had arrived at the dimensions shown in the drawing. On the twelfth day they had completely disappeared, after furnishing at the seat of puncture, an extremely small, darkish crust. The course was not observed, however, in all the twelve inoculated animals; but it was remarked that the deep punctures did not furnish more evident results than the subepidermic ones. The former, though made with a canulated needle highly charged with virus, only gave rise, indeed, to an eruption in which the papules were not so red or circumscribed as in the latter, and frequently could only be distinguished in the skin by passing the finger over them. Some deep inoculations were made by passing the virus through a wound several millimeters in extent, made by a lancet. The results were no more marked.

(*To be continued.*)

EXTRACTS FROM FOREIGN JOURNALS.

THE VETERINARY DEPARTMENT OF THE PRIVY COUNCIL.

Referring to the Report, the *Lancet* says: "However, at last foot and mouth disease has been nearly got rid of, and contagious pleuro-pneumonia is greatly diminished, though far from being extinguished. It is somewhat singular, that in view of the persistency of the last mentioned disease, the Government should ignore the benefits to be derived from protective inoculation. It is painful to read of the destruction of entire herds of cattle, only one or two of which are diseased, without this measure, the benefits of which are now placed beyond doubt, being at least tried." * * * "Glanders amongst horses is on the increase, and the returns evidently do not represent a tithe of the cases occurring. Everything appears to be left to chance with regard to this dangerous disease; there is no compulsion in the matter of reporting the existence of the malady, nor yet any attempt to have the source of those cases which are reported." * * * "From the same report it is stated that foot and mouth disease was detected among sheep imported from the United States; yet, strange to say, from all we can learn the disease is now unknown there." * * * "American swine are largely infected with trichinae, yet nothing is done to protect the pork-eating public from this source of danger." * * * The article finishes, "no account is taken of that terrifying and far from rare disease, rabies; nor is any mention made of anthrax, a malady of rather rare occurrence, but very fatal in different parts of the country, and being transmissible to various species of animals and man. * * * Tuberculosis of cattle, also, is unmentioned, though the disorder is rather rife and apparently on the increase. We wonder if the Government has heard of it and of the recent startling disclosures made with regard to its communicability, not only by inoculation but by injections of the milk or flesh of diseased cows, as well as its infectiousness through the respiratory organs."

If the *Lancet*, the leading medical organ of England, wonders

at this report of the Veterinary Department of the Privy Council, we would like to know what the medical papers of the United States would say, if they knew of the state of health of the domestic animals in this country.—(ED.)

TRANSMISSIBILITY OF TUBERCULOSIS BY THE MILK AND THE JUICE OF RAW MEATS.

In order to elucidate the question of the transmission of tuberculosis with milk, Mr. Pench has experimented with that of a cow, suffering with the disease, and giving only three or four liters of milk a day. This was given to two young pigs and two rabbits. The results obtained tend to prove that tuberculosis is transmissible by the milk, such as taken from the cow. After presenting this report Mr. Bouley presented a bottle containing portions of lungs, liver, spleen, the phrenic center of the diaphragm and bronchia and sub-maxillary ganglions obtained from a five months old pig, killed sixty-seven days after the inoculation of two cubic centimeters of juice of meat, obtaining by pressure of a piece of the ischio-tibial muscles of the same tuberculous cow. The lesions were those of a very advanced stage of disease.

Mr. Bouley says that these facts prove in an incontestible manner the transmissibility of tuberculosis by the milk, not boiled, and by the inoculation of the juice of raw meat. The danger is manifest and it is necessary that the public should be put on their guard—the inspection of slaughter houses must be more rigorous than now.—(*Gazette Medicale.*)

THE ETIOLOGY OF ANTHRAX.

In a communication to the Academy of Sciences, Mr. Pasteur, after recording the recent researches he had made on the subject, and without any expression of surprise that the Academy should doubt the exactitude of the facts he had presented regarding the contagious properties of the earth, which is such a powerful sifter, says: “The members of the Academy will be very much

surprised to hear the explanations of the enigma I have presented. Perhaps they will be startled at the thought that the germ theory, scarcely yet introduced into experimental researches, should reserve for science and its applications discoveries so little expected. Earth-worms are the messengers of the germs of anthrax. It is these who from the depths of the burying grounds, bring back to the surface of the earth the terrible parasite. It is in the small cylinders of earth with the very fine earthy particles which these worms discharge and leave at the surface of the ground, after the dews of morning or after rain, that with many other germs, those of anthrax are found. An experiment will easily demonstrate this. Take some earth, mixed with spores of bacteridies, containing the worms; let their bodies be opened after several days, using all necessary care to extract from them the earthy cylinders contained in their intestines, and a great number of carbuncular spores will be found. It is evident that if the soft earth of the surface of the graves of carbunculous animals contain germs of anthrax and often in large quantities, those germs come from the disintegration, by the rain, of the small excrementitial cylinders of the worms. The segregated dust of the earth is thrown on the plants near the spot and thus the animals which feed upon them receive the germs of anthrax, with which they become infected as we have seen in our experiments in soiling fresh clover.—*Gazette Medicale*.

UPON THE GASTRODISCUS SONSINOII, (COBBOLD,) PARASITE OF THE HORSE.

BY M. MEGNIN.

In 1876 a strange parasite was discovered, in a horse, in Egypt, by an Italian Veterinarian, who sent it to Dr. P. Sonsino. It was sent to Profs. Cobbold, of London, and Leuckart, of Leipzig. Those learned helminthologists recognized it for an entirely new specie, of the order of the Trematodes, a group of the Amphistomains; they made for him a new gender. *Gastrodiscus*, (Lunkhart) and named it *Gastrodiscus Sonsinoii* (Cobbold).

This parasite was remarkable by its orbicular shape, discoidal, with concave ventral face, covered by hundreds of little papillo-ventruses; with smooth and rounded dorsal face; presenting anteriorly a buccal ventruse at the extremity of a small neck, and a second ventruse, much larger, at the opposite extremity, to the posterior border of the body.

The parasite has been recently found at Guadaloupe, on a mule, the third one, which died of a disease so rapidly fatal that a case of poisoning was suspected. The parasites were found in very great numbers, covering the digestive mucous membrane, from the pharynx to the anus, its species being easily recognized, thanks to the report of Mr. Cobbold. We, however, observed, some slight errors in the description he gave of it: for instance, he places the genital pore in the middle of the neck, while it is at the base of that region on the ventral face, and generally concealed by a fold of the border of the body; this border is thin and membranous all round; it shrinks ordinarily in alcohol, which makes the ventral face of the animal look as if hollowed out and thick at its border. Cobbold describes it in this manner, while in reality the ventral face is flat, and continues without interruption with the thin membranous border of the body, which is spread in all directions as the fins of a turbot, of which this parasite represents almost a miniature. The dimensions are from 13 to 15 millimetres in length, and from 10 to 12 in width, the difference being entirely due to the length of the neck. The number of the papillo-ventruses, which cover the internal face of the body, is about 450.

The parasites of the trematodes order are very rare in the horse; this is analogous to the *amphistomium conicum* (Dies) which lives in the digestive organs of the ox, but which is far from being as dangerous.—*Society of Biology*.

SPLENIC FEVER ABROAD.

The S. S. "Iowa" from Boston has lately landed 804 head of cattle alive, and one dead, at Birkenhead. Forty-three died during the passage across and were thrown overboard. On beginning to slaughter, it was found that some of the cattle were

affected with splenic fever. Two carcasses were seized for this cause on the 7th inst., and six more on the following day. An order to destroy eight carcasses was, on the 9th, applied for and obtained. Several of the remaining animals already show signs of the disease, and the slaughtering is being proceeded with under the supervision of the officers of the sanitary authority. The fever appears to be of a mild type, there being no carbuncles, abscesses or erysipelas. Some of the animals, however, have shown marked head symptoms, and there appears to be no doubt about the malady being really sang de rate.—(*The Lancet.*)

AMERICAN VETERINARY COLLEGE.

EXTRACTS FROM THE ANNUAL REPORT OF THE HOSPITAL DEPARTMENT OF THE AMERICAN VETERINARY COLLEGE.

The number of animals brought before the class during the year ending March, 1880, either for treatment or post mortem examination, was 2442, an increase of 546 on the number of last year. They are represented as follows: 2198 horses, 12 donkeys, 3 mules, 6 cows, 13 goats, 171 dogs, 13 cats, 2 chickens, 1 rabbit. The balance consisted of animals kindly sent for autopsies from the menagerie of the Central Park by the superintendant, Mr. W. Conklin. They were, 9 monkeys, 2 lions, 2 camels, 1 bear, 2 tapirs, 1 buffalo, 1 fox, 2 sheep, 1 panther, 1 deer, 1 swan, The classification of diseases as represented by these animals is as follows:

1077	for diseases of locomotion.
205	“ “ digestion.
204	“ “ respiration.
119	“ “ circulation.
70	“ “ genito urinary apparatus.
68	“ “ innervation.
141	“ “ special senses.
186	“ abnormal growths.
372	“ examination of soundness.

The animals that died or were destroyed had post mortem examinations made on the cadavers, which, with the dead animals that were brought to the college, made the number of autopsies count 158.

Five hundred and sixty-six operations were performed.

The attendance on the free clinics, which are held twice a week under the direction of the medical staff and the professors of the college, amounted to 495 animals, amongst which 91 were submitted to different operations.

VETERINARY SCIENCE IN AMERICA.

The following are extracted from a letter to the *Veterinarian* written by Mr. R. Jennings, Jr., V.S., of Pittsburgh, Pa., and published in the August number of that journal. As the passages seem to reflect upon the doings of the United States Veterinary Medical Association, and as many of the first originators of the Association are still living and still members of that body, we have thought the extracts would prove interesting and worthy of correction at the hands of those members. Reference to the minutes of the Association will, as Mr. Jennings says, bring the truth to the front.—[ED. A. V. R.]

“I now believe I have made this subject clear, if not, I must admit my inability to do so. If the statements of American veterinary history made by this author were ‘unjust’ and ‘unfair,’ where was Mr. Jennings, the planner of the United States Veterinary Association, at the opening meeting at which the paper was read?

“Not knowing at what meeting the paper was produced, I cannot answer the question. But I do know that the graduates of English and French schools were not in sympathy with American veterinary practitioners, nor have they ever been. As proof number one, J. Horsburgh, M.R.C.V.S., visited the United States in 1853. He says, ‘I visited the cities of Philadelphia, New

York, Newark, Dunkirk, Cleveland, Columbus, Covington and Cincinnati, and, unless it be in New York, in all these places and the surrounding country for a distance of 1200 miles, there is not one qualified veterinary surgeon.'—*Veterinarian*, 1854, p. 252.

"Having said this much, I will attempt an answer, providing you, gentlemen, will bear with me a few moments by showing the one-sided turn taken by the U. S. V. M. A., after the convention of veterinary surgeons assembled in the city of New York, in June, 1863. When the call for an election of officers to serve one year was made, the following names for president were presented: Robert Jennings, of New Jersey, and J. H. Stiekney, a graduate of the English and French veterinary schools, the youngest man, with one or two exceptions, in the convention. The graduates of Europe urged my father to waive his right to the chair for the sake of harmony, which he willingly did (though A. S. Copeman was his choice), at the same time receiving pledges to sustain him at the next election.

"One year passes round and another annual meeting is held in the city of New York. Again he is asked to waive his right in favor of A. S. Copeman, which he did under the second solemn pledge of support at the next annual meeting. In neither of these elections was there any opposition to the candidate named. The third annual meeting was held in the city of Boston; a call for nomination of officers was in order. The names of Robert Jennings, of New Jersey, and Charles M. Wood, of Massachusetts, were presented, New York and Massachusetts being fully represented, which was not the case with Pennsylvania and New Jersey. Again my father is urged to yield his right to the chair for the last time upon pledges already twice broken. His friends for the first time objected, and Wood and Jennings were the candidates. The ballot was decided a tie vote, the president, A. S. Copeman, was called upon to give the casting vote, which is rutable in all such assemblages. He said he had already voted and for Wood; this acknowledgment gave the election to my father by one majority. Quick upon the floor, a Boston member moves for another ballot, seconded by half a dozen. Pennsylvania and New Jersey members protested, but no new ballot was taken,

and C. M. Wood, who had twice pledged himself to support my father, was counted in by one majority.

“These facts I can prove by members who were present. If these facts are disputed, I challenge the production of the minute-book.

“These facts, I think, are sufficient to account for the absence of the originator of the U. S. V. M. A., as well as his friends.”

PROSPERO.

MAY GOD PROTECT ME FROM MY FRIENDS!

BY A. LIAUTARD*

Had the poor, good old trotter the power of speech, he no doubt would have exclaimed these words when, on Sunday morning, Aug. 1, he landed in Brooklyn on his way to New Jersey, where he was to be turned out for the remainder of his life, as long as he is condemned to suffer until then, rather than to receive pity on his sufferings and to have an end put to a continued series of pains and tortures through mistaken affection.

On the last days of July his owner was informed by the veterinarian who had charge of Prospero, when and since he was condemned by us, that the *horse was in condition to be removed, that he was doing well, that all that could be done had been done, and THAT NATURE WOULD DO THE REST*,—fearful sarcastic notice, if it was not given in good faith.

Prospero left Camden and arrived in Brooklyn on Sunday morning.

Mr. Parks had the kindness to notify us of his arrival, and tendered an invitation to see him.

At first we hesitated, for our conviction of the correctness of our verdict of June last was too firm, and we knew that what we had said then would unfortunately prove true sooner or later. However, on second consideration, we decided to go to see how

*Reprinted from the *Turf, Field and Farm*,

much the disease had progressed, and what changes had taken place in those few weeks.

On Sunday morning, Aug. 1, in company with Dr. Coates, we visited Brooklyn and found Prospero in a large box-stall, as comfortable as possible. He presented the following symptoms:

He looks quite bright, and, though he has lost much flesh since our last visit, his coat looks good; the pulse is rather weak, about 40, the temperature 102 3-5. The face presents, on the right side, the same appearance as it had at first, though the healing of one of the trephined holes makes it look less repulsive. The swelling is larger and more diffused; it extends lower on the maxillary, and higher toward the lacrymal. Through the opening left there is a thin and odorless discharge. The swelling is as soft as it was at first. There is a discharge through both nostrils, purulent, sanious, with odor of necrosis. The animal, when quiet, has labored breathing; he roars some, the roaring being increased as soon as he is excited. The septum nasi is diseased. The maxillary glands are much swollen and painful.

On examination of the alveolar cavities of the four teeth which have been removed, they are found filled with granulations, and a fistulous tract is detected in the posterior part. The finger introduced in it returns loaded with the peculiar odor of necrosed bone.

On visiting him the second following day with Mr. Very, of Boston, we found him in about the same condition, with the exception that his temperature had risen to 103, and we understood he had lost some blood from the mouth.

And this is the horse which is discharged, requiring nothing more but nature to cure him, which, as it was printed, would fulfil his trotting engagements, and about which the press of New York, Philadelphia and Boston has written so many erroneous statements, thus lending the assistance of their powerful influence to quackery, ignorance and charlatanism.

We have the promise of Mr. Parks to make the post mortem.
New York, Aug. 3, 1880.

CORRESPONDENCE.

NEW YORK, August 21, 1880.

Editor Am. Vet. Review:

DEAR SIR:—Availing myself of an invitation to see a friend's horse trot, in company with him, I arrived at the Prospect Park trotting course, where, on enquiring for Supt. Jarvis, was informed that he was out in the lot with a veterinary surgeon, destroying a horse who had lacerated his gullet, as they put it. In order to obtain permission to drive over the course we started for the lot, and arrived just in time to hear the veterinary surgeon explain to the gaping crowd of horsemen who surrounded him (and who knew all about a horse) the mysteries of the cardiac apparatus. Having divided the right ventricle, he exposed the tricuspid valves, explained to the crowd that they were the semi-lunar valves; he then went into rhapsodies over the beautiful way the cardiac nerves showed themselves. At the same time, picking up the chordæ tendinoso, showing them to those around, he expressed a fear about never seeing such a sight again, and said he would take the heart away with him and have a drawing made from it; ignorant, no doubt, of the fact that in any illustrated work on anatomy he would find a drawing far superior to anything that could be produced from his specimen in the condition he had put it. He then indulged in a mild tirade on the uselessness of studying such subjects in books.

This new expounder of veterinary anatomy we were informed is a practitioner of the city of churches, enjoying a large practice, and is, I believe, a regular graduate of medicine by one of the newly-born diploma machines, called County Veterinary Medical Societies.

I know that this is but one of the many ignorant quacks who are found throughout the country, and I know also that it is best to leave them alone; but at the same time cannot help thinking of what harm the profession has received from the legally chartered machinery of these mills and the shame which must forever

remain attached to the names of those who have signed their diplomas.

Respectfully, &c.,

JOHN DOUGHERTY,

Student, Am. Vet. College.

NOTES AND NEWS.

MEETING OF THE UNITED STATES VETERINARY ASSOCIATION.

The next regular annual meeting of the United States Veterinary Medical Association will be held in the lecture-room of the American Veterinary College, 141 W. 54th Street, New York City, on Tuesday, September 21st, 1880, at 10 o'clock, A. M.

All members and friends are invited to attend.

By order,

A. A. HOLCOMBE, Secretary,

Inspector Vet. Surgeon, U. S. A.

ARMY INTELLIGENCE.

Doctor A. A. Holcombe has received the appointment of Veterinary Inspector in the army and is attached at present to the Department of the Missouri, located at Fort Leavenworth, Kansas.

VETERINARY HONORS.

We are pleased to announce the successful result of the examination of Dr. C. P. Lyman for the degree of Fellowship of the Royal College of Veterinary Surgeons.

REVIEW.

MANUEL DE MEDECINE OPERATOIRE VETERINAIRE.

By A. DEGIVE.*

We have received the little book of Mr. A. Degive. In compiling in such a short space, 277 pages, the description of the operations performed upon horses, bovine, ovine, &c., in fact, all the domestic animals, Mr. Degive has certainly performed a work which deserves credit, as it must have required on his part careful selection of what could be left out and what was essential to the arrangement of his book. Of course it is very concise, and each subject is treated as briefly as it can be done; with all that, though it cannot be compared to the most perfect and complete work of Peuch and Toussaint, the manual will no doubt prove for young beginners an excellent assistant in the various manipulations of our special surgery. It is divided into two parts. The first, being subdivided into ten chapters, is essentially applied to the horse; while in the second part, five chapters treat of the surgery of the lower domestic animals.

*Professor of Clinical and Operative Medicine to the State Veterinary School of Bruxelles.

EXCHANGES, ETC. RECEIVED.

FOREIGN EXCHANGES.—Gazette Medicale, Recueil de Medecine Veterinaire, Archives Veterinaires, Annales de Belgique, Journal de Zootechnie, Journal d'Hygiene, Clinica Veterinaria, Revue für Thierheilkunde und Thierzucht, Veterinarian, Lancet.

HOME EXCHANGES.—Turf, Field and Farm, American Agriculturist, Prairie Farmer, Ohio Farmer, Iowa Farmer, Boston Cultivator, Bulletin National Board of Health, Medical Record, Medical and Surgical Reporter, Scientific American.

BOOK.—Manuel de Medecine Operatoire Veterinaire, by Degive.

PAMPHLETS.—Etat Sanitaire des Animaux Domestiques du Brabant, Annual Report of Mercantile Library, Annual Announcements of the Montreal Veterinary College, College of Physicians and Surgeons, Meetings of the State Medical Society of Kentucky.

JOURNALS.—Colman's Rural World (St. Louis), Western Rural (Chicago), Philadelphia Record, Detroit Post and Tribune, Tribune Farmer.

LETTERS.—T. B. Rogers, W. E. B. Miller, J. C. Corlies, John Dougherty.

AMERICAN VETERINARY REVIEW,

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ORIGINAL ARTICLES.

EXPERIMENTAL ANALYSIS

OF THE MALIGNANT PUSTULE AND CARBUNCULOUS ŒDEMA; DETERMINATION OF THEIR VARIOUS FORMS AND OF THEIR DEGREE OF VIRULENCY.

By N. COLIN, of Alfort.

Observers who have industriously studied in man the accidents of local anthrax and most carefully generalized them, have failed to agree upon the characteristics belonging to malignant pustule. The descriptions they have given of it do not enable us to recognize it with certainty at its origin, nor even at a more advanced period; it would almost appear to the reader that they refer to accidents of diverse nature and aspect.

From my first researches in anthrax I was led to ask myself whether it might not be possible to produce by experimenting upon animals, the pustules and œdemas, which, followed in all their successive stages of evolution, would furnish some precise insight into their symptomatology and pathological anatomy. And in searching in this direction I have reached the conclusion, first, that on some species of animals no mode of carbuncular

inoculation will produce exactly the malignant pustule, nor the malignant œdema of man, while, secondly, with others, similar accidents may be developed in various degrees and under well characterized forms. I therefore believe I am serving the cause of pathology in presenting the results I have reached, relating to the local accidents of anthrax.

I begin by those referring to the sytmatology :

I.

When in a puncture or scarified spot, or any wound of the skin of an animal but slightly susceptible to attacks of anthrax, one inserts a little carbuncular blood, and in such a way as to reproduce the condition under which in man the malignant pustule seems to develop itself, the results observed greatly vary. For example :

1st. A simple canal, semi-closed, which for several days preserves the inserted vesicular matter.

2d. A diffused erythema, of short duration, and disappearing almost immediately upon its inception.

3d. A simple malignant pustule, more or less prominent, red and umbilicated, oozing, first a serous, and then a sero-purulent fluid.

4th. A simple œdema, without change in the condition of the skin.

5th. A pustule followed by œdema.

6th. An œdema followed by pustule.

7th. A pustule and œdema appearing simultaneously.

8th. A pustule with œdema and erythema.

9th. A phlegmonous tumor.

10th. Finally, a simple bubo, with surrounding lymphangitis.

These ten forms of local accidents of anthrax are not equally frequent. They cannot be all observed, except upon the dog, who contracts the disease with difficulty. And again they can be noted on him only by varying the regions in which the virulent liquids are inserted. For example, it is at the internal face of the ear and the axilla that the erythema shows itself; it is at the sheath round the mammæ, near the testicular envelope, and at

the neck that the œdema specially appears; it is under the abdomen, inside the folds of the flank, in all parts with thin, hairless skin, that the pustule is best developed; it is in the groin that it is most often united with infiltration, erythema and bubo; it is on the internal face of the thigh that it is complicated with extensive lymphangitis and is accompanied with sloughs and ulcerations, &c. It is in consequence of the differences in the nature of the ground where the virulent liquids are deposited, that the accidents of anthrax assume forms so varied.

It is not my purpose to describe minutely all the forms I have named: I wish simply to precisely determine the character of the malignant pustule and of the carbuncular œdema, in all the steps of their evolution, and to show how these accidents in the animal resemble and wherein they differ from those of the human economy. When the carbuncular virus has been introduced in a puncture or scarification of the skin of a dog, in a hairless spot, most ordinarily in twenty-four hours there appears a conical elevation, red at its summit, and often in its whole surface, which is in an enlarged form, the analogue of the papula or small pimple described* as the beginning of the malignant pustule in man. This elevation has at its summit a small canal, from which either spontaneously or by pressure oozes a little slightly reddish serosity. A little later, say within thirty-six or forty-eight hours, the elevation has become much enlarged. It has attained the size of a small nut, or of an almond, spreading at the base, and is depressed, even umbilicated at its summit; its red color is more marked, its epidermis becomes raised in places, the exudation ceases, and with a serosity of small confluent phlyctenes resembling the vesicles of an orange peel, from which the pustule is formed. The fluid escaping from its large opening becomes of a bad aspect and remains serous for a long time, although having a tendency to become purulent. From this moment the pustule of the dog differs from that of man. In its center there is an opening, instead of the black spot which will form the slough, and at its periphery there is a greater or less degree of œdema developed. Once formed with its essential character, the pustule

*By some and not by all observers.

may undergo various modifications. It may continue to enlarge, it may raise itself, it may assume a color, either more marked or darker, it may become blueish in its whole extent or partially. There may be a dark, blackish circle at some distance from its opening. Its base may assume the aspect of a phlegmon or remain œdematous; the ulceration of its summit may continue narrow and superficial, or may increase to such an extent as to destroy the skin and the surrounding sub-tissues to the extent of several square centimeters. But whatever may be its aspects, it runs its course in well defined steps. It has only a period of irritation and one of secretion, when it is to terminate by resolution, or otherwise; it has beside, a period of ulceration and one of suppuration, which may be of long duration. The malignant pustule of the dog differs then from that of man, in several particulars. First, it develops more rapidly. It is very well formed in twenty-four hours after the inoculation, or in forty-eight hours, or at the most in three days. From the fourth or fifth day it is in a state of rapid resolution or it ulcerates and suppurates. In no case does it show an eschar which sloughs off in mass, nor a circle of phlyctenes round its summit. Its inflammatory character is always very high, and it terminates as often by resolution without loss of substance, as by ulceration and suppuration. In all cases, it has in common with that of man the peculiarity that it is but little sensible or painful; that the oozing at the beginning is serous and remains so or nearly so to its end, if it is to be accompanied with general accidents or fatal complications. It is in the fact of its possibly serious results that the malignant pustule of animals differs from that of man. We know too well that in man, the pustule left to itself is inevitably followed by fatal results. It is even too probably and frequently so when subjected to the most judicious treatment. On the contrary, in the dog it is of a benignant character. It may reach enormous dimensions, may grow very rapidly and recover of itself, without any treatment. The dog may have two, four, six, even eight pustules, with œdema, without other symptoms than a little fever and loss of appetite, of short duration. This last essential difference is due to the fact that in the dog the car-

carbuncular accidents remain local, which in man become generalized.

Before proceeding further, we may observe that this carbuncular pustule cannot develop itself in all parts of the body. It establishes and perfects itself with its essential characteristics only in certain regions, as in parts covered with a fine skin, almost hairless, with abundant cellular tissue, rich in lymphatic vessels, such as the inferior part of the abdomen, the axillæ, groin, mammæ, perinæum, scrotum, in front of the pubis, and generally in the neighborhood of ganglions. This ground is especially favorable for it in young subjects, where it may become as serious as in the human species. Still, while these localities are favorable to the development of the pustule, it does not always render it more dangerous. Ordinarily, the most voluminous pustules, with well marked inflammatory symptoms and with rapid development, end by resolution without giving rise to well marked general disturbance. On the contrary, very often, when the pustules are less prominent, without active irritation and of slow growth, the attacks are followed by diffuse œdema, ganglionar tumefactions, ulcerations, gangrene on large surfaces, or abundant suppurations and extensive sloughs. These last pustules, small in dimensions, as when aborted, if unaccompanied with large œdema, may become more frequently than the other variety, the starting point of a general infection.

The varieties that carbuncular pustule presents, so far as its form, extent, rapidity of growth, and serious complications are concerned, are not all explained by reasons relating to the locality of their occurrence, while most of them are anatomical and physiological. These varieties have, at least, some of them, indiscernable causes, as we meet with them not only in individuals of the same species placed in conditions apparently similar, but they may nearly all be met with in a single subject. Indeed, with a given carbuncular blood, deposited in a series of inoculations sufficiently scattered under the abdomen or on the line of the mammæ, on the right and on the left, one may develop quite often almost all the forms that have been enumerated. Here an enormous pustule, very red, umbilicated, raised by a large œdema;

there a small one, conical, closed, with narrow areola; a little further, a flat pustule, pale, without peripherical œdema; by its side, another which aborts, or even a simple dry scratch without apparent reaction. Variations quite numerous in the different steps of the morbid changes are also observed. Now, the pustule which oozes serosity is one dry or another suppurating. Opposite that, where the resolution is going on well, are seen others which become purplish, sloughing round their summit, or which ulcerate superficially, or at the base of which large sloughs are taking place. We may afterwards notice that those pustules differ also in respect to the virulency of the liquid which they secrete or by which their tissue is impregnated.

The fact of the existence of numerous varieties of carbunculous pustules in animals, explains sufficiently to us the lack of agreement in the descriptions given of the malignant pustule of man. Each observer has described only the types he has himself seen; and moreover he has described of these only their character in a somewhat advanced period, having rarely followed their development from the beginning. What seems dissimilar in the symptomatology of the accident must explain realities and not errors of observation. In the future, instead of looking for an almost uniform characteristic condition, which would be wholly a fictitious idea, we shall be required to distinguish and to define all the types of the carbuncular pustules, as well as to determine what they possess in common.

(To be continued.)

IMMUNITY AGAINST ANTHRAX OBTAINED BY PREVENTATIVE INOCULATIONS.

BY M. H. TOUSSAINT.

The numerous experiments made by me during past years, upon the anthrax, have proved that the bacteridie, when introduced into the economy of animals liable to take the disease, are not there in absolutely normal conditions, though their develop-

ment always takes place in French breeds of sheep and in rabbits in sufficient force to produce death. It nevertheless thrives with difficulty, and as proof, one may say that it never reaches in the tissues or the liquids of an animal its complete period of development. *It never produces spores; its multiplication always takes place by division of the mycelium.*

On the other side, some animals never take anthrax, though their condition of life seems like those of the species which take it with the greatest facility—such is the pig. Finally, other animals become easily carbunculous in their youth, and lose this faculty in adult life or when old; such are the dog, horse and donkey, in which the young subjects always succumb to inoculation, while later, a great many resist the disease. M. Chauveau has even demonstrated that in a breed of sheep from Algeria the greatest number resist bacteridian inoculation.

These different observations suggested to me the idea of endeavoring to place the organism in such a state that the bacteridie would be unable to find in it the necessary conditions of its development, and with this object in view I have undertaken many experiments. After numerous unsuccessful attempts, I at length arrived at a very simple method of preventing the bacteridie from multiplying in young dogs and in sheep. In other words, I am able actually to vaccinate sheep which resist inoculation and intra-vascular injections of considerable quantities of bacteridies, whether in the state of spores and obtained by culture, or in the form of short rods, as they are found in the blood of the animals which have recently died of the affection. The result of the experiments made up to the present time and which evidently demonstrate this statement, I now present.

Dogs.—I observed myself that dogs from birth to six months of age take anthrax very easily by simple punctures, and that when dead they present very large quantities of bacteridies in the blood, and at the same time very extensive local and glandular lesions.

Eight hunting pups born of three dams were placed on experiment. Four were vaccinated by my process, and four were not. I had chosen my animals in such a way that in both lots there

were brothers. The four vaccinated animals resisted four successive inoculations by injection of carbuncular blood, made under the skin. The four others not vaccinated died by the first inoculation, within from two to four days, with large œdema at the point of inoculation. The nearest ganglion had increased from ten to fifteen times beyond its natural size. It was filled with bacteridies; their number was much higher than that of the blood corpuscles.

At the first inoculation of anthrax, the vaccinated animals had a little fever, and in two there was a very slight œdema at the point of inoculation. The other points of inoculation acted as simple wounds.

SHEEP.—They belonged to the breed of Lauragnais, in which anthrax called *spontaneous* is very common and fatal. My experiments were on eleven animals. Five were inoculated *once* but at different times, and died of it in two or three days. I have never seen one of this breed, which I employed for some years in my experiments, to resist the injection of bacteridies, whatever quantity was used.

The six remaining were inoculated with anthrax, and one died with the ordinary symptoms. The five remaining received a second vaccination, and after the lapse of a month I made in each three sub-cutaneous inoculations with carbunculous blood of a dog, a rabbit and a ewe, and one of spores, without giving rise to either local or general phenomena.

The absence of the local phenomena indicated that the blood itself was unfit for the reproduction of bacteridies. I have, indeed, introduced into the facial vein of four of these animals two or three drops of blood from a rabbit, which, considering the number of parasites, represented for each animal a total of about two hundred millions of bacteridies introduced directly in the blood. Those four sheep presented no morbid phenomena.

To-day these animals are in good health and are not at all affected by the different processes of vaccination or inoculation. They will return to their flock, and I propose to inoculate them from time to time to find out the length of this innocuity. I can now affirm that it will last more than two months.

MODE OF INOCULATION.—I first used the filtration of carbuncular blood from a dog, sheep or rabbit. For that purpose I took the blood of an inoculated animal, as he was about dying or immediately after death. This blood was defibrinated by beating, run through a cloth and filtrated through ten or twelve sheets of paper. It is by this process that three pups three months old, and the first ewe, were vaccinated. But this is a dangerous method and not at all practical, as often the fissures allow bacteridies to pass through, and they cannot be recognized with the microscope, as they are very few, and then animals which we wished to save were killed.

Being unable to obtain a filter giving a sufficient quantity of filtrated matter, I used heat to kill the bacteridies, and exposed the defibrinated blood to 55° temperature for ten minutes. The result was complete. Five sheep vaccinated with three cubic centimeters of this blood have been inoculated with very active carbunculous blood and have shown no effect from it.

However, to obtain a complete immunity, it is necessary to make several inoculations. Thus, after the first preventative inoculations, I inserted under the skin of the ear of two sheep carbunculous blood of the rabbit and spores of culture. One of these died with a large number of bacteridies in the blood.

I then inoculated again the four remaining sheep with the blood of the dead sheep, after heating it to 55°, and since that time each sheep has been inoculated twice with carbunculous blood without result.

OSTEO SARCOMA—SPINA VENTOSA.

(Read before the United States Veterinary Medical Association.)

In speaking of diseased processes of bones, Zundel, in his excellent Review of D'Arboval's Dictionary, says: "Sarcoma have particularly been observed in the bones of the face, where they may assume considerable size; the bones which are thus affected are then tumefied, puffed up, as in *spina ventosa*. They

are more frequent in bovine animals ; though Foster has seen them in the pig, and Bruckmuller in the horse, where they have been found in the maxillary sinus, extending sometimes in the nasal and in the masseter."

In the article "Cancer of Bones," Lafosse writes: In the second form, for it admits of four, all the tissue of the bone is affected, and the organ presents a more or less voluminous enlargement, which, under the microscope, is composed of a long areolar tissue, whose cells are filled with the more or less soft cancerous tissue. The bones of the face present frequent examples of that disease." And again, "in the third form, the bone is puffed up and forms large lodges, in which the cancerous tissue is developed ; and if by section or putrefaction the tissue is removed, the bone has the aspect of a waste box, divided into compartments by this septum, complete or incomplete, and having its walls formed by a very thin sheath, cribbed with openings. * * This is called *spina ventosa*. We had seen very handsome cases of that disease in the jaw of the ox and of the horse."

Roll, in the "neoplasms of bones," says "Sarcoma develop themselves sometimes in the bones of the face of bovines, and may present a large size. Bones affected are tumefied, puffed up, as in *spina ventosa*."

According to Virchow the name of "osteosarcoma" was not adopted until modern times. Until the middle of the present century it was understood to be the same tumor named by the Arabs, *ventositas spinæ*, or *spina ventosa*, or by others *osteosteotoma*, and again by others malignant exostosis. Williams says that osteosarcoma are "tumors of irregularly protuberant surface, affecting both the upper and lower jaw of horned cattle, of generally slow, but sometimes rapid growth," and Gamgee, under the name of fibro-plastic degeneration of bone, calls a disease of young cattle known by some veterinary writers as osteosarcoma, *spina ventosa* and other inappropriate names.

This general review of the definition of the disease seems to prove that while different names have been given to a diseased condition of bone, it is generally admitted that a cancerous degeneration takes place, and that more commonly animals of the

bovine species are affected with it. No doubt many of you have seen jaws of oxen which were thus diseased, and several beautiful specimens of it can be found in most collections of veterinary specimens. As I have been fortunate enough to observe what I consider four cases of osteo sarcoma (or spina ventosa) in the horse, I thought it might prove interesting to this Association to hear a few words respecting them.

The first animal was seen by me some nineteen years ago. It was a handsome grey horse advanced in years, the pet of a family, who for several years had been more or less suffering with it. When shown to me he had on the right side of the face, covering the whole surface of the flat of the cheek, a large tumor of the size of a child's head. Covered with the skin, which was healthy, this tumor was well defined, hard here and there, though giving a sensation of some softening when pressed at different places. It was not movable, had been there for several years without incommoding him, and was even now apparently harmless, as the animal ate well, though slowly, and was even able to do his work as a family horse. My advice was to let him alone. But through the strong influence of others I was induced to assist in an attempt to operate upon the horse for the removal of the whole tumor. Dr. Busteed, whom most of you know, an able surgeon and excellent operator, was to perform the operation. Without giving you the minute details of the manipulations employed, I would say that from the moment the knife was applied to his jaw, the hemorrhage was abundant. Cutting through the tissues without hesitancy, and trying to isolate the tumor and reach healthy structure, the doctor could scarcely see his way through the sheet of blood, which was running profusely, notwithstanding the rapid and strong attempts which were made to control it, the actual cautery even, being powerless before the hemorrhage. After nearly two hours of hard work, the operation was stopped, a portion only of the tumor being taken off, the animal having died from loss of blood.

The second case I observed in a black horse used for hacking, young, robust and ambitious, belonging to a livery-stable keeper in New York. He was passing before my office every day, and

for months I had an opportunity of seeing and watching him. His face presented on the right side a tumor, an idea of which you can have by examining the plaster cast which is now in the museum of the college. It covers the whole extent of that side of the face, on the upper jaw, from the lower end of the maxillary spine upward toward the lacrymal and the nasal, down the large maxillary bone. Though surrounded by a diffuse swelling, the tumor was somewhat round and well defined. Like that of the first case, it was immovable, painless and soft here and there. It had had a slow growth and is supposed to have started from a blow given by a hustler a year or so before. There was a purulent discharge from the right nostril, which was much increased by work. When at work, he roars noisily. He ate well, seemed in good health otherwise, and, as I said, performed his work daily. Consulted upon his condition, I recommended to have the horse destroyed. Instead of that, a veterinarian induced the owner to allow him to tap the tumor and allow the escape of the pus. The permission was granted, and a lancet introduced into one of the soft spots of the surface of the tumor. A little pus escaped, but the owner said to me afterwards, "that blood flew profusely," and it was difficult to stop the hemorrhage. Several weeks after, I bought the horse for a trifle and had his head macerated, and you can see the condition of the bone.

The third case is not so distinctly present to my mind, but Dr. Peabody, who prepared the specimen, can correct me if my memory is imperfect. It is that of a bay horse which was brought here to one of the clinics of the college, and had on one side of his face a swelling similar to those already described, with about a similar history. The animal was destroyed, and the specimen is presented to you for your observation.

The fourth case is already familiar to you, both by what has appeared in the *AMERICAN VETERINARY REVIEW* and other papers, sporting as well as daily news journals. It is the case of the black trotting gelding, *Prospero*. If you will refer to the article, which I wrote and published in the July number of the *REVIEW*, you will see that the characters of the tumor are similar as to its external appearance, its mode of development, and what was not

mentioned then, and makes it more nearly similar to the others, in its tendency to bleed, for Dr. Miller told me, and here I use his own words as nearly as I can remember, "the hemorrhage was very difficult to stop, so much so, indeed, that I began to feel uneasy, finding no blood vessels to tie." As Dr. Miller said, "I am not afraid when I can see blood vessels and apply a ligature, but *there I was*." In the September number of the *REVIEW*, I published a little note of the condition of the patient, and to-day I present you with a photographic likeness of the condition of the horse. I hope the opportunity which has been promised to me by the owner to see the post-mortem, and to have the head presented to the college, will allow me to show you once more that the "erroneous diagnosis" which has been so widely attributed to me by a regular member of the profession, and, I am sorry to say, by some in connection with charlatans and quacks, was not an error, but on the contrary one which, for the sake of humanity, only ought to have been listened to, and the poor animal spared the unnecessary and cruel treatment to which he was afterwards subjected, first, by having three of his teeth extracted, and six weeks later, trephined a second time. I beg also to correct here, as long as it has not yet been done, an error which found its way into the newspapers, and of which I understand advantage is to be taken, to cover the ignorance of certain parties. The first operation of trephining was performed by somebody, but not by me. The operation was useless, as well as all others which have been performed since, and I desire here, to protest strongly against any accusation of having operated at any time upon Prospero. And in any case, we all know that the diseased process being there, operations or no operations, it could not have been brought on by them, though any of them might have served as a stimulating cause.

Now, Mr. President and Gentlemen, while I must beg your pardon for occupying so much of your time, may I ask of the members present, if something relating to the etiology of this affection can be derived from the above observations.

According to Zundel and Lafosse, osteo sarcoma is due to a vice of nutrition of bone-structure. Roll, placing them amongst

the neoplasms, considered them probably alike. Virchow says, speaking of epulis, or spina ventosa: "It is probable that the essential influence is here exercised by the primitive starting point, that is to say, that it is the mucous tissue of the dental follicles, or the pulp of the developed tooth, or the surrounding tissue of the tooth, periosteum or bone, which serves as the matrix of the tumor;" thus fixing a diseased process of the dental structure as the exciting cause. Williams attributes them to tubercular diathesis, and Gamgee, who says that "there is no recognized cause for the disease," attributes it to a morbid condition of the bony structure.

It therefore seems evident that it is due to a peculiar alteration in the nutrition or development of bony structure, and that through a medium of a special irritating cause, as says Virchow, "the mucous tissue of the dental follicle, or the pulp of the developed tooth, or the surrounding tissue of the tooth, periosteum or bone," the ultimate development of the tumor will take place.

I was in hope some time ago, that out of the four cases I have reported, one at least would prove in a satisfactory manner the influence of a special manifest proof, and I thought that I could show you that the presence of a decayed tooth might be the cause of osteo sarcomatous formation.

If you will allow me to transgress for a moment: When I made my diagnosis in my last case, I stated that the horse was suffering with osteo sarcomatous degeneration of the face, brought on by carious teeth, and probably stimulated by the improper extraction a healthy molar. This was an error, as you will be able to judge in a moment.

Mr. Gadsden, of Philadelphia, in *Turf, Field and Farm*, and in other papers, makes the claim that he has the credit of having found the true cause of the trouble in Prospero's case, a claim which he has the privilege I am very willing he should enjoy, of having contested by a horse-dentist of this city, both stating that there was no osteo sarcoma, no big head—for they seem to make no distinction between the two diseases—but diseased teeth, carious teeth, and that if they were pulled out the horse would get well.

Gentlemen, here are the three teeth which Mr. Parks has received, as being those of his horse, and which he has had the kindness to lend me for this occasion. Dr. Miller, who has had them in his possession, sent them himself to the owner, and will assert that they are the originals, notwithstanding the denial made by those who may have an interest in concealing the truth, and no doubt by your examination you will certainly acknowledge that none of these are diseased sufficiently to justify their removal, that none of them are diseased enough to have produced all the trouble; in fact, two of them, you will notice, are perfectly healthy, and one has but two little insignificant spots of decay, of the size of the head of a small pin.

Were these the result of disease of the dental pulp, as Virchow says, the matrix of the tumor, I leave it to you to say, but certainly you will all acknowledge that if I have not succeeded in pointing out a cause for osteo sarcoma, I have shown you that there is one thing important which veterinary schools must place in their curriculum, and that is a course of *Veterinary Ethics*.

EDITORIAL.

PROSPERO.

To satisfy one of our correspondents, and in justice to him, we reprint to-day a very long letter on the trotting horse Prospero. As much has already been published on this *cause célèbre*, and as the poor horse died at Goshen on the 22d instant, we will not say any more on the subject, except to give the result of the post mortem examination, which we made some twenty-four hours after death, and which will appear in our next issue.

When we were called to give our opinion about the condition of the horse, in May last, and after our opinion had been given in writing to his owner, we received a letter from Dr. Gadsden of Philadelphia, to which we answered. Both of these letters appear in this issue of the *Review*. We will be pleased now to

show Dr. Gadsden and his student the head of the horse and his *decayed teeth*, if they will do us the honor to call at the American Veterinary College, where all can be seen by any one interested.

EXTRACTS FROM FOREIGN JOURNALS.

MICROSCOPIC AND COMPARATIVE CHARACTER OF THE SOURCES OF HORSE-POX, COW-POX AND HUMAN VACCINE.

BY C. MEGNIN.

The author has examined the four following samples of vaccine:

1st.—That collected from the pustule of a heifer, obtained from a second culture of horse-pox.

2d.—Fresh vaccine from a heifer, resulting from the culture of the Beaugency cow-pox.

3d.—Human vaccine, of the Academy of Medicine, preserved on slides and dissolved in a drop of water.

4th.—Human vaccine recently obtained from the arm.

The four liquids examined by M. Megnin with a magnifying power of $\frac{1}{800}$ diameter, show a great number of punctiform corpuscles, which he considers sporuliform microbes. In the first two specimens (horse-pox and cow-pox), they have a uniform size of one thousandth of a millimeter; in the two others (human vaccine), the diameter is one fifth smaller. M. Megnin asks if the passage of horse-pox through human organism, as it diminishes the size of the microbe, does not also alter its activity. He has also remarked that the microscopic preparations were the next day loaded with such quantities of these microbes that it had become milky in aspect—(*Academie of Medicine*).

RUPTURE OF THE UTERUS, AND OF THE RIGHT UTERINE HORN DURING GESTATION, IN A COW.

BY M. LADAGUE.

On the 22d of June, at 10 P.M., I was called to attend a cow, which, since 3 o'clock, seemed dull and tympanitic.

History.—The cow was seven months pregnant, was kept in

permanent stabulation, and even watered in the stable. Fifteen days ago she was indisposed, somewhat tympanitic, and received a drench of oil and brandy: she got better. During the same afternoon there appeared a kind of soft tumor, spreading over the vulva, anus, extremities of the ischium and base of the tail. The tumor was of the size of two fists. It was rubbed with marshmallow decoction, and two hours later it had disappeared. The next day the cow was well; she ate well, milked as usual, and showed nothing except a little stiffness behind. That day and the following she milked half a liter more than usual, her appetite remained good, but she was still stiff behind, notwithstanding the frictions of warm vinegar which were made on her hind legs.

The calf, which was easily felt on the right side, was only so felt on the left from the first day of sickness; and from that day, when it was said to have moved much, no more motion was detected.

Condition of the Animal.—At my visit she was lying on her right side, moaned at each respiration, and was slightly swollen. In feeling the left side, the animal moaned oftener. A certain quantity of gas was easily detected in the abdominal cavity, but not in the rumen, for that organ is separated from the abdominal walls some four or five centimeters. Inferiorly, as far as a third of the height of the abdomen, a mass of floating liquid was easily heard by pressing upon the abdominal walls. Respiration, 32; pulse weak, 88; conjunctiva infiltrated; nose, ears, horns and extremities were cold. The udder was flask, not large. The vulva was not larger than normally, and from it oozed a little sanious, brownish, fœtid liquid.

I informed the owner that his cow had aborted, that she had peritonitis, and that her tympanitic condition was caused by it.

The os uteri was not closed, but was rigid, and allowed only the introduction of the extremities of the fingers brought together. Through this manipulation the nails of one leg were felt. The neck was then covered with belladonna ointment, and in a short time, after a second fruitless examination, the cow died without a struggle.

Post mortem.—The abdomen being opened, there escaped a large quantity of gas of a very disagreeable odor of putrefaction. About twenty to thirty liters of brown, wine color fluid, mixed with some clots of blood, were removed. All the digestive organs were normal. The peritoneum was much congested, this condition increasing from forward-backward, and reaching its maximum near the pelvis; there, also, it was thicker, and on the side of the intestines offered on its internal face five bloody, floating clots, from fifteen to twenty centimeters in length, and adherent by one of their extremities. The peritoneum being loosened behind, showed in the intestinal mass a female foetus, all bloated, crepitating, the legs coming easily apart at the seat of articulation. The nails dropped off almost of themselves, one of them even floating in the liquid of the abdomen. The extremity of one hind leg was turned toward the neck of the uterus. The foetus was not covered by its placenta, which remained adherent to the cotyledon, but was by the umbilical cord. I cut the cord, and brought the foetus out of the abdomen. The uterus was torn from five or six centimeters from the neck to the extremity of the horn, in which the foetus was lodged. This tear was about straight, and followed the inferior border, or rather the lower plan of the uterus, and continued in that manner, following the small curvature or concave border of the right horn. The borders of the wound were one centimeter thick, of well marked brownish color, which did not disappear by washing. The placenta was in an advanced state of putrefaction, and still adhered to some of the cotyledons. The neck of the uterus, vagina and left horn were in perfect condition.—*Archives Veterinaires*.

FETAL DISTOCIA.

ASCITIS-CIRRHOSIS OF VENOUS ORIGIN, MITRAL AND TRICUSPID ENDOCARTIS.
VERY LARGE PILARS OF THE LEFT VENTRICLE.

BY M. NOCARD.

A cow, six years old, having had several calves, being at term, veterinary attendance was secured. She had been in labor 12 hours, and during that time had been in the hands of farmers'

boys, neighbors, and the quack of the village, who had been pulling on the hind legs, which showed themselves in a posterior presentation, lumbo-sacral position. The foetus was yet alive, the distocia being due to abdominal dropsy. A cut with the bistouri gave exit to about 25 liters of fluid. The delivery followed easily.

The post mortem of the foetus showed the following lesions: The liver was very large, weighing 2 kilograms 500 grams ($4\frac{1}{2}$ lbs.); the gall bladder was empty, the cystic canal obliterated, the choledon canal largely dilated. The liver was rosy, firm, dense, and very resisting; on section, the blood vessels were considerably dilated. So was the vena cava and the portal vein, which measured about 7 centimeters in diameter.

In the thorax, the lungs were healthy, the pleura dropsical, the pericardium contained a little serosity, all the afferent veins were very large, the heart was enormous, weighing 800 grams, and its walls were much thickened.

The arterial openings and their sigmoid valves were normal, but the three lobes of the tricuspid presented on their borders a large number of small vegetation, reddish, easily torn and of recent formation. Some conditions, more marked, on the mitral valves. All other organs were normal.

In the left ventricle, fleshy columns, eight to ten in number and of the size of a finger, were inserted by their extremities, dividing, ramifying and anastomosing together so as to form a fleshy mesh, filling up the entire cavity of the ventricle.

This observation is interesting: 1st, as being one of the foetal distocia by increase in size of the abdomen. 2d, It is one of the first where the true cause of the abdominal dropsy has been traced. 3d, It is a very rare example of valvular endocarditis in a foetus (no other being known to me in veterinary obstetrics). 4th, Finally, the hypertrophic development of those fleshy columns have not, as far as known, been reported in veterinary or human medicine.—*Archives Veterinaires*:

SOCIETY MEETINGS.

UNITED STATES VETERINARY MEDICAL ASSOCIATION.

NEW YORK, Sept. 21st, 1880.

The eighteenth annual meeting of the United States Veterinary Medical Association was held yesterday in the lecture-room of the American Veterinary College, Prof. Jas. L. Robertson presiding.

The following members answered to their names at roll-call, viz.: Chas. Burden, J. C. Corlies, W. J. Coates, Thos. C. Cowhey, O. H. Flagg, S. S. Field, J. D. Hopkins, C. H. Hall, A. Liantard, A. Lockhart, C. P. Lyman, R. Laidlaw, C. B. Michener, W. B. E. Miller, L. McLean, G. P. Penniman, C. H. Peabody, J. L. Robertson, A. H. Rose, J. H. Stickney, Wm. Saunders, Wm. G. Schmidt, Wm. J. O. Sullivan, T. S. Very, and J. F. Winchester.

Minutes of last meeting were read and adopted.

Unfinished business being next in order, the amendment proposed by Dr. Liantard at the Boston meeting was considered. Art. 4, Sec. 1 of By-Laws was read by the Secretary, as it stands and as per amendment. On motion of Dr. Liantard, the consideration of this proposed amendment was deferred.

The Comitia Minora reported favorably to this meeting the following applicants for membership: H. B. Boyd, Wm. H. Rose, A. P. Weeks, Ralph Hall, P. Z. Colsson and J. Gerth, Jr., all being graduates of veterinary schools in good standing. Other gentlemen were proposed, whose credentials not having been brought before the Board of Censors, were deferred until the next regular meeting of the Association. A. Liantard, President of Committee on Education and Intelligence, read an able paper on the subject of Veterinary Education, closing with: "I will now move that the motion made by me last March, relating to the examination of candidates to membership, be rescinded: that the different veterinary schools of the country, through their Board of Trustees and Faculty, be urged to increase their requirements for matriculation, to lengthen the course of studies, and to have a board of

examiners, taken from the regular graduates through the country, to act with the Faculty at the examination for graduation, one examiner for each department;" and moved that "no candidate for admission to membership in this Association be admitted as such unless graduated under the last named condition, his degree being then a voucher for his qualification for admission." After several of the members had expressed their hearty approval of the suggestions of Dr. Liautard, the report of the committee was accepted and placed on file. On motion of Dr. Hopkins, the subject embodied in the above report was referred to the Board of Censors, with power, and that they report the concurrence, or otherwise, of the different colleges at the next meeting.

The amendment proposed at the meeting last March was laid on the table. A vote of thanks was tendered the Committee on Education and Intelligence. The editor of the AMERICAN VETERINARY REVIEW then gave a very encouraging account of that journal, its circulation having more than doubled, and that it is regarded by foreign countries as the organ of veterinary science in America, extracts being taken by French, German and other veterinary journals. Financially, too, it is more than self-supporting.

By a vote of twelve ayes and one negative, the following gentlemen were declared members of the Association: H. B. Boyd, Wm. H. Rose, A. P. Weeks, Ralph Hall, P. Z. Colsson and Julius Gerth, Jr.

Candidates for membership at Boston meeting next March: W. Henshaw, D. Cochran, W. H. Lillyman, Thos. Blackwood and Chas. R. Wood.

The Treasurer's report was then read and accepted, showing the finances of the Association to be in good condition.

The following officers were elected for the ensuing year:

PRESIDENT, Prof. Jas. L. Robertson; VICE-PRESIDENT, O. H. Flagg; SECRETARY, C. B. Michener; TREASURER, Chas. Burden.

BOARD OF CENSORS: Drs. Liautard, Lyman, Lockhart, Thayer, Coates and C. Michener.

A recess of half an hour was then taken.

Meeting of Association was recalled and communications were

read from Drs. Holcombe, R. A. McLean, E. F. Thayer and P. Z. Colsson.

A letter of resignation from A. Liautard, begging to be relieved of the editorship of *AMERICAN VETERINARY REVIEW* at the completion of the present number, was presented to the Association. After remarks by several members, and by motion of Dr. Corlies, the subject was laid upon the table.

A paper was read by Dr. Liautard, on disease of bones—osteosarcoma—which deserved and obtained the unqualified assent of most, if not all, of the members present. The writer illustrated his subject by specimens of the disease, by plaster casts, and went on to speak of the *causes* of this affection, showing conclusively in three specimens presented, that the idea entertained by some, that this condition arises from diseased teeth, is untenable; that the extraction of teeth supposed to be diseased but makes matters worse and hastens the inevitable result.

Dr. L. McLean presented specimens of shoes and braces for the treatment of rupture of suspensory ligaments and in the operation of tenotomy.

Dr. Peabody presented a paper, reporting a very interesting case in his practice, with the desire to learn the exact nature of the disease, as well also as to get an expression of opinion as to the treatment employed. Remarks followed by a number of members. Theodore Outerbridge, of Bermuda, favored the meeting with an account of alcohol and belladonna in the treatment of tetanus; fully 50 per cent. recovering in his practice. He gave the credit chiefly to alcohol, which he administered in the drinks.

Dr. Liautard reported three cases of "breaking down" as following seemingly slight injuries to the extremities. The Association then adjourned to dinner at Delmonico's, where speeches and toasts were eagerly listened to. At about 11 P.M. was adjourned one of the most interesting and pleasant meetings of the Association.

C. B. MICHENER, D.V.S.,

Secretary.

HUMAN AND ANIMAL VARIOLÆ: A STUDY IN COMPARATIVE PATHOLOGY.

BY GEORGE FLEMING, F.R.C.V.S., ARMY VETERINARY INSPECTOR.

(From *The Veterinary Journal*, London, England. Reprinted from the *Lancet* for March 20th.)

(Continued from p. 246.)

The apparent absence of a specific character in the papular eruption produced by inoculating the small-pox virus, might have led to the belief that it was merely inflammation produced at the seat of puncture. For instance, the first animal inoculated was a calf, which was inoculated at the vulva. A number of small papules appeared, and it was imagined that a very characteristic eruption of cow-pox was about to be developed; but instead of developing into pustules, they rapidly disappeared without leaving any trace of their existence, and then the result was considered negative, and the animal put to one side. But being desirous, some time afterwards, of producing cow-pox by means of vaccine lymph of Neapolitan origin, this calf, being at hand, was vaccinated from a magnificent pustule raised on another calf which presented a very fine vaccinal eruption. On the eighth day the inoculation had quite failed, greatly to the astonishment and regret of the Commission, as, relying on its success, they had not provided themselves with any more lymph, and had to send for another supply. Thinking that the inoculation had not been properly performed, when the new lymph came it was tried again with the utmost care, but another failure resulted in this calf, while with other two animals—a horse and a calf—vaccinated at the same time, there was a beautiful eruption. The Commission were now compelled to admit either that the small-pox inoculation had produced a specific eruption capable of protecting the animal from vaccinia, that it had been previously affected with that disease, or that it had no receptivity for the vaccine virus. At that time only about eight bovines had been vaccinated, and it was not certain whether this species would contract the cow-pox

in this way. The experiments were continued; altogether ten animals were variolised, and then vaccinated some days afterwards; but six had no vaccinal eruption whatever, three had rudimentary and ephemeral pustules, and one only showed a regular and characteristic cow-pox. Considering the readiness, as was afterwards found, with which true cow-pox, human vaccinia, and horse pox could be inoculated, and that the former could only be produced very exceptionally when the animals had been previously variolised, the conclusion arrived at by this important chance discovery was that variolisation exercises a neutralizing influence on the development of vaccinia; and that the slightly-marked eruption, so undecided in character, caused by the inoculation of small-pox virus on bovines, is of a specific nature—in this species presenting, with the cow-pox, the same relations that variola and vaccinia do to each other in the human species.

It is curious to note that, in 1863, the same (Lyons) Commission was desirous of discovering whether small-pox could be transmitted to animals, and they made a number of inoculations, but all these apparently failed. Subsequently the animals were inoculated with human vaccine, and the same negative result followed. But it was never suspected then that the vaccination failures were due to the previous variolation, supposed to be ineffective, and it was concluded either that human vaccine takes with difficulty on the bovine species, or the animals experimented upon had previously been affected with cow-pox. It would thus appear to be demonstrated in the clearest manner that variola and vaccinia are related, or rather opposed; to each other in the bovine species, in the same way as they are in mankind. The negative results following variolation in animals which had been successfully vaccinated, was a crucial test of the soundness of this demonstration. Three animals—a cow and two calves—were variolised and vaccinated at the same time, the small-pox matter being inoculated on the left side of the vulva, the vaccine lymph on the right. In the three there appeared on the right side the very characteristic vaccinal eruption, and on the left the typical papular eruption engendered by variolation, as in two of Ocely's experiments.

To prove whether, after all, the papular eruption produced by small-pox might or might not be a mild kind of cow-pox, the feeble eruption of which could, by a methodical cultivation on bovines, become more developed, its transmission was attempted to other cows; for the eruption differed from human small-pox in being always local, while the papules, neither in volume, external characters, nor development, bore the slightest resemblance to that disease; whereas by its localization, development, and the absence of general phenomena, it did somewhat resemble cow-pox, though in other respects it widely differed. Three calves inoculated from the fully-developed eruption with all the care possible, showed still less local alteration, while with a young bull it entirely failed, and subsequent vaccination was most successful. From this it was concluded that the variolic virus, instead of being cultivable in the ox tribe, loses its activity, and scarcely produces any effect in the second generation.

Was this eruption, then, merely that of modified small-pox? The results of small-pox inoculation on man are nearly as well known as natural small-pox itself, and there could be no mistake in the result if this bovine eruption was successfully re-transmitted to the human species. With the object of proving this, an unvaccinated infant, three months old, was inoculated with a very small quantity of serosity obtained by scraping some of the papules on a variolised cow. Four days afterwards on one of the punctures a pimple was noticed, which soon assumed all the characters of a vaccinal pustulla, and in nine days it was large, umbilicated, surrounded by a red areole; very irregular at its periphery, and covered on its surface with a kind of small vesicle; it was *aquarellée*. When opened, only a very small quantity of fluid could be obtained from it to inoculate the arm of another child. Next day the infant was feverish and ill, and on examining it carefully a great number of small pimples were found on the face and trunk; on the following day these were fine variolic pustules, the majority of which were umbilicated, and formed a quasi-confluent eruption. In a week the pustules were desiccating and the child recovering.

The child inoculated from this one had three punctures on

each arm, all of which had a *bouton*; in eight days from inoculation the development of these was complete, and they so closely resembled vaccine pustules that several competent persons asserted they were such. The next day two small vesicles appeared around each pustule, and in four days some small-pox pustules (about fifteen) showed themselves on the face and other parts of the body. The child did not appear to be unwell, and the slight general eruption disappeared rapidly without leaving any traces.

Thus, in a second generation in the human species the variolic virus from the cow had produced much better local effects than in the first, and incomparably feebler general effects. What might it have been in a third or a fourth generation? The fear of creating an outbreak of small-pox in the hospital brought these transmissions to a conclusion. But even the very decided results obtained did not suffice to satisfy the Commission. After all, the eruption on the children, though it appeared to be due to nothing more than direct inoculation of human small-pox, might be only generalized vaccinia, which some authorities assert does occur. But such a confusion between the two diseases was proved by the foregoing experiments to be impossible. Deposit humanized vaccine beneath the skin of a calf, and an eruption of unmistakable vaccinal pustules is obtained, which can be indefinitely transmitted to animals of the same species. But inoculate with small-pox virus, and there is only an insignificant papular eruption, the transmission of which from one calf to another is extremely difficult, if not impossible.

To meet any objections, however, that might afterwards be raised in this respect, two calves—a male and a female—were inoculated with virus from the last-mentioned child. In seven days, in both animals, there was a somewhat microscopic papule at the seat of puncture. One of these papules—on the scrotum of the male—was used for the inoculation of another calf, but the result was absolutely negative; proving, in the first place, that the virus transferred from small-pox infected man to bovines, and carried back to man again, is still small-pox virus, and is not converted into cow-pox virus; and in the second place, that small-pox is not vaccinia.

Some experimenters had previously attempted to inoculate the horse with human small-pox, but met with only negative results. The Lyons Commission undertook several series of experiments on this animal, somewhat similar to those on bovines, and arrived at analogous conclusions. The horse was as susceptible of inoculation as the ox tribe, and the same phenomena were produced; but the papular eruption developed at the punctures was so evident, that no doubt whatever could exist as to its presence and its specific character. Indeed, it was so greatly developed that inexperienced observers might have mistaken it for horse-pox, particularly at the commencement. But in horse-pox, as in cow-pox, and even more so in the former, there is a secretion and the formation of a crust; but these are nearly, if not quite, absent in the inoculated variola. The same experiments were made in vaccinating after inoculation, and *vice versa*, as with the ox, with exactly the same results. The horse was also proved to be as little adapted to the cultivation of small-pox virus as bovines. Three children were inoculated from the horses, and though the phenomena observed are of considerable interest, yet I cannot allude to them in this place, but will merely remark that the patients offered symptoms, mild in their degree, similar to those which follow small-pox inoculation. The result arrived at was that, as with the ox, the horse returns the small-pox virus to man just as it receives it. But the production of variola in the three children was followed by a mild attack of natural small-pox in an unvaccinated infant in the same room; and its mother, who had been vaccinated as a child, was soon after affected with a true varioloid eruption, with fever and other signs of general derangement.

The variolic virus obtained from the equine species was cultivated in mankind to the fourth generation, and produced a local and somewhat modified general eruption. From the second generation horses were inoculated, and only the typical variolic exanthem was developed—never the unmistakable horse-pox. Transferred from the horse again to the ox, in order to be assured that the eruption engendered by the cultivation in man of the small-pox virus, transferred originally from him to the horse, was not that of vaccinia, another series of experiments on cattle was in-

stituted. Many horses were inoculated, and the conclusion arrived at was, that when carried to and cultivated on the cow, after producing in mankind, for several generations, local eruptions altogether identical in appearance to vaccinia, the variolic virus of the horse only develops the phenomena of variola, as in the bovine species.

Thus it will be seen how earnestly and exhaustively the Lyons Commissioners accomplished their task, and what conclusive results were arrived at. We can find no evidence anywhere in their report that the small-pox virus was merely deposited in a little pouch, and re-inoculated from it again. On the contrary, marked phenomena were developed in every instance, and the crucial manner in which one series of experiments was made to test or control the results arrived at in another, left no room for doubt or error. Many of the experiments were original, particularly those on the horse, of which there were nine series.

The Commissioners, in closing their report, refer to the positive experiments of Thiele and Ceely as opposed to their negative ones—experiments which, they say, were extremely important, and which, notwithstanding the erroneous conclusions of their authors, will always hold a considerable position in science. Thiele and Ceely, they add, each experimenting independently, succeeded in giving cow-pox to cattle by inoculating them with human variola, and this cow-pox became the origin of an excellent vaccine, which was cultivated in infants for more than twenty years, in certain parts of England, Germany, and Russia, and has passed through a great number of generations. It is not denied that they succeeded in obtaining positive results from their attempts to inoculate the cow with variola; but that which is astonishing, after the results arrived at by the Commission, is not these positive facts, but the negative results which other experimenters almost unanimously acknowledge. But had Thiele and Ceely well observed and closely interpreted the facts the manifestation of which they elicited? Is it really true that they succeeded in converting variola into vaccinia? The Commissioners think not, and are of opinion that the children they inoculated with their variolic vaccine had nothing else than small-pox, the

same as the children in the Hôpital de la Charité. This kind of inoculation is now-a-days well known, and it is really not necessary to have recourse to a new inquiry to appreciate its signification with regard to the doctrine of identity of variola and vaccinia. What did Thiele and Ceely communicate to the cow? Was it cow-pox? It was nothing of the kind. The excellent drawings made by the Commissioners, representing the characters of the eruption produced in the ox by variolation, are evidence that there is not a very distant analogy between cow-pox and the results of small-pox inoculation. The Commissioners had not seen Ceely's drawings, consequently they did not know if they differed from those it produced; but they ventured to assert that if they differed from these, and represented eruptions of veritable small-pox, the artist had not been absolutely inspired by the real truth. Nothing that Thiele and Ceely had done in inoculating the cow with variola could have produced anything resembling cow-pox, not even the extensive variolous wounds that were obtained, by making long and deep incisions in the skin, and pouring large quantities of small-pox virus therein. But if their cows did not have cow-pox, how were these two experimenters able to vaccinate children with the matter from them? The cows could not give that which they had not, say the Commissioners; and this is why, they affirm, the children operated on by Thiele and Ceely received small-pox; and it was nothing but small-pox which was developed on all their inoculated subjects. It was variola such as the Commissioners had seen in their own experiments—variola limited sometimes to the local primary eruption, and quite like vaccinia; variola often accompanied by a secondary eruption, which gave it its special physiognomy. Between the descriptions of the two experimenters, and those given by the Commissioners, as to the eruptions which offered benignant characters, there was not the slightest difference; and if the children inoculated by the latter were affected with variola in consequence, so should those of Thiele and Ceely. If the virus of the latter is really vaccine, then it should give cow-pox to the cow at once, like the Jennerian vaccine; if not, then it will only produce papules of the variolic eruption.

With regard to the pretended innocuousness of Thiele and Ceely's so-called vaccination, reported to be as absolutely harmless as true vaccination, the Commissioners did not believe that it was due to the passage of variolic virus through the bovine species, as it was found that it underwent a considerable attenuation in the organism of the ox, and could only be propagated through a very limited number of generations; but when returned to the human species, it appeared to regain all its activity. When first transmitted from man to the ox or horse it caused a very abundant, almost serious, secondary eruption, while all the children inoculated from this transferred virus had a discrete and almost insignificant eruption. The Commissioners clung to the opinion that Thiele and Ceely only practised variolisation, instead of vaccination; and they therefore gave the children they inoculated better protection than if they had been vaccinated, if they did not expose them to more dangers. A question of much interest is that of the innocuousness of mediate variolation, and if it be proved to exist, the Commissioners thought recourse would at once be had to Thiele and Ceely's method when good vaccine lymph could not be procured. But there is the grave danger of *contagion*; for in passing through the organism of animals the small pox virus loses none of its infectious properties. Experience has only too well proved this, and this is why mediate variolation, like direct variolic inoculation, would create, if it became generalized, permanent centres of infection, which would soon cover nearly the whole globe. This danger does not exist with the vaccine virus; and therefore it is, that vaccination will always hold the first place in the prophylaxy of small-pox.

I think I have now offered sufficient evidence of a clinical and experimental kind to prove that the variola of man is not that of the cow, and that by no possible means can the virus of the one be transmitted into that of the other. The bovine organism cannot reduce a general eruptive disease, due to an exceedingly infectious virus, to a merely contagious and very mild disorder, accompanied by a limited local eruption. No more can the organism of the sheep; for the many experiments which have been performed with the small-pox virus have not modified it in

any respect, and it has retained all its original infective properties. Neither can the human organism transform vaccinia into variola, for had this been possible, surely the millions of vaccinations which have been made under every condition during this century, would have afforded us some evidence of such capability. If vaccinia cannot be transformed into variola, as little probability is there that variola can be changed into vaccinia.

Years ago the veterinary professor, Hering, had repeatedly inoculated the cow with vaccine lymph, and found that this gave it renewed potency. The veterinarian Numann made similar observations, and incidentally noticed that the bull is as susceptible as the cow; also that the horse and ass are, but that their vaccine, when re-transferred to man, is slower in its action than that from the cow. Besides, the transmission of vaccinia by inoculation from cow to cow is accomplished without any difficulty, and the successive transplantations of the same lymph does not appear to have any influence on the development of the resulting pustules. In the very numerous experiments of Depaul, it was found that the pustules of the last inoculated animal offered the same characters and dimensions as those of the cow first inoculated. How is it, then, that the vaccine virus can be transmitted for generations from cow to cow, cow to horse, or horse to horse, retaining all its primitive potency, and even becoming revived when carried from the human species; whereas the virus of human variola only produces a local papulation in them, quite unlike vaccinia, which can rarely be reproduced more than two or three times, and which always develops small-pox when inoculated again on man?

From all the evidence I have adduced, there is every reason to think that those experimenters who imagined they had produced vaccinia by inoculating the cow with variolous matter, were in error; and if it be true that they employed the virus from the cow in vaccination, then if the above evidence be accepted as trustworthy, there is reason to believe that it was merely the small-pox virus returned again to the human species, just as it was obtained from it. There are instances on record in which the most serious results have followed the attempts of imitators of

Gassner, Thiele, Ceely, and Badcock—outbreaks of small-pox resulting. Have the widespread epidemics of small-pox in recent times been to any extent due to these inoculations of the cow with human variola, with the view of obtaining vaccine lymph?

However these questions may be answered, one thing must be looked upon as definitely settled, and that is, that small-pox is not cow-pox; they are independent and distinct members of a family group, and can no more be transmuted or converted into each other than can two dissimilar plants or animals. The error in supposing that they are transmutable—or rather, that small-pox can be converted into vaccinia—was due, in all probability, to inacquaintance with experimental methods, an inability to appreciate the results of experiments, and imperfect knowledge of animals and animal disorders. No crucial experiments were resorted to, as with those of the Lyons and Turin Commissions, and what may have looked *like* vaccinia was accepted *as* vaccinia. In no other way can I account for what must now be considered a grave error.

In insisting upon the correctness of this view, and urging its importance not only with regard to comparative pathology, but also the prevention of an odious and destructive human plague, I am well aware that I am placing myself in an attitude of antagonism to very high and estimable medical authorities in this country; and especially Sir Thomas Watson, who, in a paper in the *Nineteenth Century* (which paper has been recently republished in a small volume), says, “The truth is, that the vaccine disease is really small-pox rendered mild by passing through the system of the cow; the great object of inoculating the small-pox was to produce a benignant form of the disease by diminishing the number of its pustules.”

I have shown that there is no relationship between the prevalence of the cow-pox and small pox, and that the one may, and does, prevail in localities, and at times where and when the other is not seen. In Denmark, for instance, small-pox is all but extinct, and yet cases of cow-pox are far from rare. The difficulty experienced by those who believe in the unity of the two diseases, in accounting for this circumstance, is attempted to be got over

in various ways. Bollinger, for instance, (*Sammburg, Klinischer Vortrag*, No. 116), thinks that cow-pox owes its existence sometimes to humanized vaccine—the most extended and extensive of all the forms of variolic contagium; he says, “We must look,” he writes, “to humanized vaccine as the source from which the greater number of cases of bovine variola have their origin.” A few instances are certainly recorded in which, apparently, accidental infection of cows by recently vaccinated people has occurred. Oslander alludes to the case of a cow which was so infected by a boy who had been vaccinated a short time previously. In the Prussian veterinary reports on contagious diseases among animals for 1870–71, Koch reports that the vaccination of the people on a farm occasioned the infection of the cows with cow-pox, and in the same reports for the following year an outbreak of vaccinia was announced as having taken place among a lot of cows, consequent upon the re-vaccination of three dairymaids. In three weeks the disease appeared, and gradually extended, so that in fourteen days, of twenty-six cows, only three escaped. The majority of the cows had only a few pustules upon the teats, but others had a number upon the teats and udder. In the same reports for 1874–75, Danman describes an outbreak of vaccinia in several sheds in the Rugen Kries, while in the district many children had been vaccinated, and the vaccine vesicles were fully developed. Schneider informed Bollinger that in 1876, after several children in a certain locality had been vaccinated, four cows in two sheds in the same place became affected with cow-pox; two dairymaids became accidentally inoculated from these, and one of the women communicated the infection to her children, who had not been vaccinated. Reiter also told Bollinger that in cowsheds where he vaccinated cows, several non-vaccinated animals showed the characteristic indications of the disease, which ran its course in the ordinary manner.

Though there is no reason to believe that cow-pox is infectious—*i. e.*, *virus volatile*—yet there is as little reason to deny that cows may not become affected through contact with newly-vaccinated persons, provided that some vaccine lymph obtains access through a sore. But it is evident that this chance inoculation

will not account for many, if any, of the reported cases of eow pox.

(To be continued.)

CASES FROM A NOTE-BOOK.

BY T. B. ROGERS, D.V.S.

CEREBRO-SPINAL MENINGITIS.

A horse aged nineteen was affected with cerebro-spinal meningitis. His temperature for three days varied little from 100° Fah.; his bladder was evacuated by pressure with little difficulty, and he stood well in the slings; for three days there was almost complete anorexia; on the fourth the animal had some appetite and his general condition was improved. After eating half a bucketful of mash and whinneying for more, he fell as if shot and was let down from the slings. The heart's action was bad and weak, the respiration rapid and shallow, the membrane became cyanotic; there was no "besoin de respirer;" the flapping of the velum palate was quite audible, and in ten days he was dead.

Diagnosis: sudden effusion and pressure on the respiratory and cardio inhibitory tracts of the medulla oblongata, probably from rupture of a degenerate vessel. This case is interesting as showing in a beautiful manner the result of the obliteration of the functions of these centres and the necessity of very cautious prognosis in animals past their prime, even when everything is taking a normal course.

ACUTE INDIGESTION.

BY THE SAME.

A mare aged seven had an attack of acute indigestion, with much tympanitis; she fell on the road and was with difficulty got under cover; sensation was blunted from the action of ear-

bonic dioxide, and the patient was bathed in a profuse cold perspiration. *There was constant eructation of gas, and the œsophagus stood out prominently on the left side, looking like an enormous and not well circumscribed jabot.* The pressure of gas resisted considerably the passage of liquid medicine. She was given first a stimulant drench with ammonia, afterwards a ball of ammonia carbonate and a rectal injection of sodium carbonate (washing soda). The symptoms continued for a long time, the mare got down and was kept up with difficulty; the heart's action having grown weak, she was given a hypodermic injection of 4 gm. tr. digitalis, and with the slowing and strengthening of the heart she improved. Much gas was passed per rectum, and the eructation from the stomach and dilatation of the œsophagus continued for several hours after all tympanitis and discharge of gas per rectum had disappeared. The mare made a good recovery.

I quote this case because I never saw or read of this curious state of the stomach and œsophagus; the eructation of gas was almost constant. In this connection I may mention that in all my cases of flatulent colic the first favorable sign has been a return of the intestinal murmur, and I should be pleased to know if this is a general experience.

BRONCHITIS.

BY THE SAME.

A driving mare nine years old had rapid respiration with the coarse dry rale of acute ordinary bronchitis, so marked as to be perceptible to the laity, one of whom described it as something like two rough boards rubbing together. Her temperature was 106 Fahr. and she had had a marked chill. The pulse was strong and full. She was given 1 gm. of tr. aconite rad. hypodermically and a ball of ammonia carb. and bellad. extract; a mild stimulating liniment was applied to the extremities and chest at 9 P.M. Next morning her temperature was 103 Fahr., skin felt natural, and the mare ate her mess—no treatment, and on the following day the mare was discharged entirely well. I give the credit to

the injection of aconite, though there is room for doubt as to whether it was a case of "post hoc" or "propter hoc." There was no doubt as to the seat of the rale, it was well marked and plainly heard at the base of the neck and over the large bronchiæ. In connection with this, I may mention that I use hypodermic injections of tinctures and fluid extracts constantly, do not dilute them, and have had no cases of abscess from their use.

CORRESPONDENCE.

CAMDEN, N. J., August 10th, 1880.

Mr. Editor :

DEAR SIR:—During the last two months the newspapers and veterinary journals of the country, and particularly of New York and Philadelphia, have published various articles relating to the trotting horse "Prospero."

Many of the articles have been misrepresentations of the facts, and as my name has been frequently mentioned in connection therewith, I deem it my duty to give the profession a true history, so far as I can, of Prospero's case from the time I first saw him until he left my place for Brooklyn, New York.

On Sunday, the 28th day of March, in company with Cooper B. Hatch of Camden, New Jersey, and Dr. George H. Bailey of Portland, Maine, I visited Mr. John E. Turner's stables at Point Breeze Park, Philadelphia, Pa. While looking through and examining the stock, we were shown into Prospero's stall, and for the first time I saw the noted trotter. Mr. Turner removed the blanket and remarked that the horse did not seem to feel very well and thought perhaps that he might have taken a slight cold while coming from Brooklyn a few days before. He called our attention to the general appearance of the animal, saying as he did so that he would have been ashamed to have sent a horse from his stables to any one to handle looking as badly as this horse did.

Dr. Bailey and Mr. Turner entered into a conversation concerning the horse, his previous performances and future prospects,

and I took occasion in the meanwhile to look him over thoroughly. I observed that he was discharging freely from the right nostril, and upon opening his mouth I was struck with the peculiar foetid odor escaping therefrom. I also saw a bunch upon the right side of the head, about as large as a walnut. Never having met Mr. Turner before that day and not being asked for any opinion concerning the horse, I passed out of the stall and proceeded to that occupied by the stallion Nil Desperandum.

About two weeks from that date I was again in Mr. Turner's stable, and in Prospero's head, from the open stall door I noticed that the bunch upon the side of the head had grown considerably in size, and that the peculiar odor which before had smelled when I opened his mouth, could now be smelled from the open door.

On the 2d day of May, I made a third visit to Mr. T's stables, for the purpose of performing a surgical operation upon a colt belonging to Mr. Ellis. After the operation was completed I was asked by Turner to examine Prospero and tell him what was the matter with him, remarking that he could not condition the horse, and was unable to do any work with him, or words to that effect. I went to Prospero's stall and was surprised to find that the bunch had grown still more, that the discharge from the nostril was greater, also that a discharge was escaping from the mouth, which, when opened, emitted a very offensive odor very much like that given off by diseased bone. I said to Mr. Turner that I thought the horse had carious teeth, and perhaps necrosis of the jaw bone. Mr. Turner replied, saying that one tooth had already been extracted by a Dr. Clark, a traveling horse dentist, recently in Philadelphia, which when removed had been perfectly sound. I then opened the animal's mouth again, and passing my hand back distinctly felt the cavity whence the third molar tooth had been taken; the alveola muscle was very much irritated and swollen. Within the cavity there was collected a quantity of half masticated food which I removed. Again I obtained the odor peculiar to diseased bone. I then examined the nostril very carefully and observed that the discharge from that was of a different character and did not have the very offensive smell of that which came from the mouth. And I said to Mr. Turner

that I thought the discharge thence was in part, if not entirely, due to a suppurative condition of the frontal sinuses, and that in order to give the necessary relief to this part the operation of trephining the sinuses would have to be resorted to. I then told him how that operation was performed, and advised him to write to the owner of the animal and tell him as nearly as possible the condition of his horse and request that something should be done to give him relief. He then asked me to write my diagnosis of the case, stating just as nearly as I could Prospero's condition, excepting so far as related to the removal of the tooth by Mr. Clark, as he would explain that to Mr. Parks himself. I thereupon wrote a short history of the case as I found it and it was enclosed and sent to Mr. Parks. In a few days I received a postal from Mr. Turner requesting me to come to his place and take charge of Prospero's case, by order of the owner.

Accordingly, on the 9th of May I visited the horse, (for the first time professionally) with the evident intention of trephining his frontal sinuses, and doing whatever else I thought best under the circumstances. I again made another examination, and found that all the former symptoms were very much aggravated, and the animal much more depleted. On passing my hand over the surface of the enlargement I could feel a spot near its center more soft than the balance, and could feel it fluctuate as though containing pus. I called the attention of Dr. Hugh Legambre, a practitioner of Philadelphia, who was present, to the condition referred to. I then told Mr. Turner I had resolved to trephine the animal, and Dr. Legambre kindly offered to assist me. I then gave the animal an anæsthetic and proceeded to cast and secure him for the operation. Having done this, I examined the softened spot in the enlargement on the side of the head more thoroughly, and concluded to open it. After cutting down about an inch, or perhaps more, I had an escape of pus of the same offensive odor as that which escaped from the month. This soon ceased, and a severe hemorrhage followed. I then passed my finger into the wound, and pressing it down toward the bottom of my opening, it came in contact with a large mass of diseased tissue, which gave way before my finger, when, to my surprise, I

found the blood running into the mouth instead of through the opening I had made. I then pressed my finger farther down, and felt it go into the cavity made by Mr. Clark when he removed the tooth. To prove this, I passed my other hand into the animal's mouth, and extending my index finger into the cavity, brought the ends of my fingers in contact with each other. By this time the hemorrhage had become very severe, and I discovered that the animal was swallowing. I was therefore obliged to suspend further operations and stop the hemorrhage, and with the assistance of Dr. Legambre I soon had it under control. I then plugged the wound with a lint of oakum, as well as the cavity whence the tooth had been taken, and as the horse appeared somewhat prostrated, concluded to suspend further operations for the present and take the animal to the stable. I called to see him the next day, and observed that the animal had rubbed the oakum from the wound, and that it was discharging pus similar to that which had previously escaped from the mouth. I took a probe, and inserting it into the wound, passed it directly into and against the inside of the jaw bone in the cavity left by the tooth. I could also feel what I conceived to be a loose piece of bone. I took my forceps, and placing them in the opening, seized upon and removed a wedge-shaped piece of bone about as large as my thumb nail. I felt again, and obtained another, and repeating the operation, removed a third—the last two smaller than the first. The three pieces, when fitted to each other, corresponded, and would about make up the space in the external portion of the jaw bone through which my finger and my probe had passed into the alveolar cavity, and which had no doubt been fractured and misplaced when the tooth had been removed, giving rise to the irritated condition of the alveolar labialis muscle. After thoroughly cleansing the wound, nostril and mouth with carbolic acid, dressing and placing the horse under careful treatment, I left him again without trephining. I visited him regularly semi-weekly until about the first of June, during which time he continued to grow worse, and both Mr. Turner and myself became alarmed for his safety. I told Mr. Turner several times during these visits that I believed it to be a sarcomatous degeneration of the

muscles surrounding the jaw bone, and perhaps of the bone itself, and that I thought it was the result of an external injury, or might be produced by carious teeth. I was satisfied that the removal of the healthy tooth had very much hastened the present condition, and that my own operation had probably assisted somewhat. I then resolved to go and see the owner, and tell him as correctly as I possibly could the condition of his horse. For this purpose I visited New York, having first telegraphed Mr. Parks that I was coming and wanted to see him in person. I called at his office, introduced myself, and was very kindly received by Mr. P., who immediately asked me, "Doctor, what is the matter with my horse?" I replied by saying that I was fearful it was "*osteo sarcoma*," a disease which I had frequently seen in cattle, but had never to my recollection seen a case in the horse, and I would rather he would send some veterinary surgeon who had had some experience in this disease to see the case. He replied that he had consulted Dr. A. Liautard, of New York, who was coming to see the case, and if it was anything that was incurable he wished to have the animal destroyed as humanely as possible, and his body buried, as he wanted no old hacker to have his bones. I then obtained permission to remove the animal to my infirmary in Camden, which was done on the 5th of June. On the 6th, Dr. Liautard, of New York, was sent by Mr. Parks, the owner, to see the animal, and after making an examination, pronounced the disease to be "*osteo sarcoma*, or degeneration of the bones of the jaw," and said he would advise the destruction of the animal when he saw the owner.

On the morning of the 7th I left home for a ten days' visit to the Eastern States, having first given my assistant full instructions as to care and treatment of Prospero while I was absent. I knew nothing of Mr. Parks' decision in relation to the case until my arrival in Boston on my way home from Augusta, Me. on the morning of the 16th of June, when I received a letter from my assistant, from Camden, containing the following telegrams:

BROOKLYN, N. Y., June 8th, 1880.

W. B. E. Miller, D. V. S., Camden, N. J.:

Invite all the boys to be present at Prospero's death and burial, and charge expenses to M. J. Parks.

NEW YORK, June 11th, 1880.

W. B. E. Miller, Veterinary Surgeon, Camden, N. J.:

Destroy Prospero at once. Send head by order of owner.

A. LIAUTARD.

On the 17th of June I returned to New York, and in looking over the morning papers was surprised to find that they had published obituaries on the death of Prospero. I called at the office of the New York *Sun* and asked them to correct the report and state that the order would be carried into effect on Saturday, the 19th of June. Now, Mr. Editor, if you will think for a moment that I knew nothing of the result of the conference between Mr. Parks and Dr. Liautard, nor had any communication from either of them, from the time Dr. Liautard made his diagnosis of "osteosarcoma" until my return from Maine, during which time the newspapers all over the country were publishing the "big head" theory, you can readily conceive how grossly I have been misrepresented when they published the assertion that I had pronounced it a case of big head, or "*osteo porosis*."

I arrived home late on the evening of the 17th, and on the morning of the 18th went to my infirmary to see Prospero. I found him much better than I expected. The discharge had considerably lessened and he was eating and feeling quite good, and I remarked that it was too bad to have to destroy such a horse. However, I prepared to carry out the instructions, and drove to Point Breeze Park to invite the boys, as Mr. Parks directed. On my way I called at the offices of the Philadelphia *Record* and *Item* and invited them to send a reporter. I then called on Dr. J. W. Gadsden, veterinary surgeon, with whom I was personally acquainted, and gave him an invitation to be present. I then returned to my office in Camden, and was shown three telegrams which had been received during my absence, which read as follows:

NEW YORK, June 18, 1880, 8:30 A. M.

Dr. Miller, Camden, N. J.:—Could I see Prospero alive? Will come on first train. Answer.

213 West 53d St.

C. D. HOUSE.

NEW YORK, June 18, 1880, 11 A. M.

Dr. Miller, Camden, N. J.:—Please answer my dispatch of this morning.

C. D. HOUSE.

NEW YORK, June 18, 1880, 2:39 P. M.

Dr. Miller, Camden, N. J.:—Will be in Camden 6:20 to-night.

C. D. HOUSE.

To the first two of these my student, Mr. John A. Johnson, had sent affirmative answers as soon as they were received, and I gave him instructions to meet Mr. House at the depot and take him to the stable, in lieu of an answer to the third, as I had a professional call to the country which would detain me until a late hour and I would be unable to go to the depot myself. When the train arrived Mr. Johnson was there, and waited until all the passengers had left, and not seeing Mr. House, he returned to my office, where he found Mr. House awaiting, he having gotten off the train before it reached the station. He then took Mr. House to the stable and showed him into Prospero's stall. Yet, in spite of these facts, at least one New York paper and one journal have published articles asserting that "Dr. House had great difficulty in getting permission to see the horse and examine him. On my return to my stable, at about half-past nine or ten o'clock, I found Mr. House awaiting me. He told me that he had carefully examined Prospero, and the whole trouble was from his teeth, and if they were removed he was sure the horse would get well. I said that I feared that time had passed, and that while I had received peremptory orders to destroy the animal, I very much disliked to do it, owing to his great value. He remarked that he was very positive Mr. Parks would not have the horse killed (if he could see him in his present condition) under

any circumstances whatever. It being very late, I invited Mr. House to accompany me home, and we would decide upon the case in the morning. Accordingly, on Saturday morning, June 19th, we again visited the stable and made another thorough examination of Prospero's mouth. I was fully satisfied as to the condition of his teeth, and when Mr. House, in manipulating the mouth, stated that the sixth molar was already loosened, I said to him "we will pull his teeth." I then took a small pair of forceps from my case and gave them to Mr. House, and he immediately placed them within the buccal cavity and tried to get hold of the tooth, but found the forceps too short, and he could not reach the tooth with them. I said to him, "I have a large pair at my office, I will send for them," and calling to the young man who had the care of the stable, I started him for the forceps. This man, on his way to the office, and when nearly two squares from the stable, says he met Dr. J. W. Gadsden and his student on their way to the stable to see Prospero, and recognized him at the time.

After the attempt to remove the tooth, we closed the door of Prospero's stall and had just stepped to one side, when Dr. Gadsden drove in. I introduced him to Dr. House and invited him to examine the horse and tell me what he thought the difficulty to be. He did so, and in making his examination used a speculum which he brought with him, as I had nothing but a small balling iron at the stable. After satisfying himself he called me outside the stable and said, "Dr. Miller, this is not 'big head.'" I told him I did not think it was. He said he thought the whole trouble was carious teeth, and the removal of them would certainly relieve the horse, and that if he was in my place he would not kill this horse under any circumstances, as it would not only reflect upon me but upon Dr. Liantard *and his college* as well, and he hoped that such a mistake would not be made. I told him I had already made up my mind not to destroy the horse at this time, would disobey orders, would extract the teeth, and sent my student to hurry up the man with the forceps.

All being ready Dr. Gadsden and myself, each assisting Dr. House, extracted the teeth, consisting of the third, fifth, and sixth molars, the fourth having been removed by Mr.

Clark some time before. We had quite a severe hemorrhage together with a slight discharge of pus. On examination of the teeth two of them, the third and sixth were found diseased, the fifth entirely sound. For a time the horse seemed to feel somewhat depressed in spirits, but soon rallied from the effects of the operation. After a day or so the swelling was considerably reduced. The general condition of the animal seemed to improve, he ate such food as was given him with a relish, although he did not improve in flesh. The discharge from his wound entirely ceased, while that from his nostrils lessened, and that which escaped through the alveolar cavities either decreased entirely or was swallowed by the animal, which from future developments I believe now to have been the case. I wrote the owner several times stating to him the general condition of the animal. About the middle of July I received a letter from the owner stating that Mr. Chas. Backman had consented to keep the horse for the rest of his life, and that as soon as he could be safely removed he was anxious to get him there. I then wrote him that I thought Prospero would be able to go away on or before the first of August, if nothing more serious should occur. The horse in the meanwhile, although very thin in flesh, was apparently doing as well as could be expected, and although his chief food had been eggs, milk, wheat, shorts, and soft food of any kind, he would now eat hay, oats, grass or anything he could get.

I then wrote to Mr. Parks stating that I thought Prospero could be removed, that I had done about all that I could do for him under the circumstances, and that nature would do the rest; meaning that should the horse live and get out to green grass, nature would assist him just as much as I or any one else in restoring his former flesh and condition, and this was written in good faith and with no motives of "sarcasm," as has been suggested in an article published in a New York journal. The day following the horse was unfortunate enough, while running at large in a grove adjoining the stable, to pick up a piece of corn cob and in chewing it forced a piece into the cavity left by the removal of one of the teeth, and a severe hemorrhage followed its removal. The horse in consequence appeared much worse than he had been

for some time, and refused to eat anything for a day or so, as a result of which he emaciated very rapidly. The discharge from his nose again set in and was followed by another from the month the odor from which was very similar to that present with the animal when he first came from Point Breeze. I immediately wrote Mr. Parks again and told him all the symptoms. I received an answer from him stating that he was not at all surprised; that the discharge from his nose for six months was from no ordinary cause, and that he was very anxious to get the horse to Mr. Backman's place, where he would have a good home for the rest of his life, and that he would send for him on the following Friday. Accordingly on the following Friday evening, July 30, he left my place in charge of Mr. Alonzo Nodine, of Brooklyn, New York, to whom I gave all the information I could concerning the method of feeding, dressing and caring for the animal that I had employed since the removal of the teeth.

Now, Mr. Editor, I am sorry I have been compelled to extend this to so great a length, but I want the public to have the facts of the case from the beginning, and while I am not so anxious to *crave credit as to assert* that other articles are wilful falsehoods, I do say they were misrepresentations, and cast a reflection upon me that I felt duty bound to correct in order to vindicate myself. I should have replied to them long ago, but that I felt that while the horse was in my possession I should keep perfectly silent.

I am, sir, with respect,

Yours very truly,

WM. B. E. MILLER, D.V.S.

PHILADELPHIA, June 19, 1880.

Prof. Liautard:

DEAR SIR:—I was requested by Dr. W. B. E. Miller, of Camden, N. J., to examine the horse "Prospero" yesterday morning before he destroyed him. The doctor informed me he was afflicted with the disease commonly known as "big head," and that you had been sent on by Mr. Parks to examine him and had pronounced it an incurable case of that disease, and advised the horse's destruction, which the owner wished Dr. M. to put into effect as

humanely as possible. He informed me that he could not allow a post mortem examination of the head, as he had promised you it should be sent to your college at once.

On my arrival at Dr. Miller's with my student, a few minutes before the time appointed for the horse to leave for the place of execution (as the Camden authorities will not allow horses to be killed in the city limits, he was to be buried at Mr. Hache's farm), I was very much surprised to find upon examination of the horse that you had made a mistake. Having read that morning in *Turf, Field and Farm*, page 393, "The Last of Prospero," of course I expected to demonstrate to my student, Mr. F. Standem, the terrible disease so common in horses from the Mississippi valley, as I thought it such a good chance for him to make himself thoroughly acquainted with the symptoms of this disease.

You may imagine my surprise to find the noted Prospero only suffering from diseased molar teeth and their alveolar cavities, with an *enlargement only over the region* of the same, on the off side of the upper jaw, with an offensive discharge of pus from that nostril. I have seen several such cases, and as I have seen several cases of the disease known as "big head," you must excuse my differing from your opinion, and advising Dr. Miller to communicate with the owner of the horse for further instructions, before destroying so valuable an animal.

Yours respectfully,

J. W. GADSDEN, V.S.

ANSWER.

NEW YORK, June 22, 1880.

J. W. Gadsden, Esq.:

DEAR SIR:—Your kind letter of the 19th reached me last night. In answer, I beg to say that I am quite satisfied with the diagnosis I have made, and am not sure yet that my prognosis was wrong.

Thanking you very much for your courtesy, I am,

Yours very truly,

A. LIAUTARD.

APPENDIX.

DISEASES OF DOMESTIC ANIMALS.

BY M. H. PAAREN, M.D., V.S.

We have received the proof-sheets of the above named pamphlet, which, if we understand rightly, is to appear as an appendix to a cyclopedia of 1200 pages, published, we presume, in Chicago.

It is known that cyclopedias, except when they are works like the *Cyclopedia Britannica*, are written with the idea of conveying to the public a large quantity of knowledge condensed in as short a space as possible, and therefore the appendix on diseases of domestic animals is intended for the same object. Short, concise, and neatly gotten up, it consists of numerous hints to the owner of domestic animals, who lives far off from veterinary advice, and as such may prove to the intelligent man of some assistance in the hours of sickness of his live-stock.

EXCHANGES, ETC RECEIVED.

FOREIGN EXCHANGES.—*Revue für Thierheilkunde und Thierzucht*, *Gazette Medicale*, *Recueil de Medecine Veterinaire*, *Veterinary Journal*, *Veterinarian*, *Clinica Veterinaria*, *Revue Dosimetrique*, *Revue d'Hygiene*.

HOME EXCHANGES.—*American Agriculturist*, *Prairie Farmer*, *Medical Record*, *Turf, Field and Farm*, *Medical and Surgical Reporter*, *Scientific American*, *The Physician*.

JOURNAL AND PAPERS.—*Home Farmer* (Louisville), *Daily Mirror* (Manchester), *Sunday Herald* (Boston), *Southern Live Stock Journal* (Mobile).

PAMPHLETS.—*Liqueur de Villate*, by N. Gille; *Trichinae in Relation to the Public Health*, by F. S. Billings.

ANNOUNCEMENT.—Toronto Veterinary College.



AMERICAN VETERINARY REVIEW,

NOVEMBER, 1880.

ORIGINAL ARTICLES.

PROSPERO.

MALIGNANT TUMOR OF THE FACE AND NASAL CAVITIES—DEATH
BY STARVATION AND REPEATED SECONDARY HEMORRHAGES. *

BY A. LIAUTARD, M.D., V.S.

Mr. President and Gentlemen :

The specimen I have to show you this evening is one of malignant tumor of the face and nasal cavities, obtained from a very valuable animal, of great reputation on the trotting turf, and which may be known to you by the reports which appeared at different times in the newspapers. It is the head of the trotting horse Prospero, which I condemned as incurable in May last, and which was allowed to die from starvation through mistaken kindness of his owner, imposed upon by ignorance and charlatanism.

The history of the case is, in a few words, as follows: Some

* Paper read before the New York Pathological Society.

time in April, this animal was stabling in Philadelphia, and was noticed to have a little swelling on the right side of the face. This increased by degrees and was accompanied by offensive discharge from the nose. Shown to a veterinary dentist—for that specialty claims to exist in veterinary medicine—he examined the mouth, said that he found a decayed tooth, extracted it, and though the tooth proved healthy, said, “it was all right, and the patient would get well.”

Still, he did not get well, the swelling kept on increasing, the discharge became more abundant and offensive, and a veterinarian called to see him and made a diagnosis of suppurative collection of the sinuses, and advised trephining. This was done. The tumor then was quite large, soft at places and the opening through the maxillary bone was done with a simple scalpel, showing how diseased it already was. This operation was no more successful, and I was requested by the owner to see his horse. The doubt, I thought, was not possible. The animal had a cancerous degeneration of the bones of the face—sarcomatous, I believe—and I advised him to be destroyed.

At the time when he was about being killed, a veterinarian of some celebrity in Philadelphia, and another pretended horse dentist celebrity of New York, who were present, declared the action of destroying a disgrace, as the horse was suffering with decayed teeth only and would recover if those were removed.

This permission was granted and the 4th, 5th, and 6th molars were extracted. All you can see are healthy, with the exception of a small decayed spot on one.

The horse did not improve for that. Still, at last, and for reasons that I cannot understand, he was returned to his owner, with the information that everything that humanity could do was done, and that nature would do the rest.

Again, however, our horse dentist, who had written through the newspapers of his success in the case, finding his patient not recovering fast enough, calls another veterinarian, this time from Brooklyn, professor in one of the veterinary colleges of New York, and once again the horse is submitted to surgical interference. He is trephined in the upper part of the nasal bone, through

the turbinated bone and then sent to the country, to his birth-place, to complete his recovery, which was at times reported as making fast progress.

The animal died on the 22d of September, and the post-mortem proved that death had taken place by starvation, complicated by repeated secondary hemorrhage from the palatine artery of the right side.

The following are the notes taken from the autopsy made 24 hours after death :

The animal lay in the field where he had been turned out, on the left side. His body is fearfully emaciated, bones protruding, muscles atrophied, nothing in fact but skin and bones is left of the still good looking horse seen but a few weeks before. His abdomen round the flank is much retracted and measured scarcely three feet in diameter. The skin removed exposed all the muscular structure pale, flabby and free from any fat. The abdomen open, shows the intestines retracted to almost nothing, the stomach contains a bolus of green food about the size of two fists, the small intestine is entirely empty, contracted in almost its whole extent, and in places reduced to a very small size, about one inch in diameter, the large colon contains a certain quantity of food, grass seeds and earth mixed together, perhaps six pounds in weight, the cœcum has a little watery food in it, the small colon is empty, the mucous membrane of these organs is pale and shrunk all over.

The spleen and kidneys are healthy, the liver also, though somewhat softened by the post-mortem. The lungs are generally healthy, a little emphysematous in the anterior lobe. The pericardium is filled with serosity. The heart is pale, flabby, with post-mortem clots in both ventricles; large blood vessels almost empty all through the body; ganglions of the abdomen and chest infiltrated.

After severing the head from the neck at the occipito-atloid joint, the skin, before being removed, presented on it the marks of the openings where it had been trephined, neither of which were cicatrized.

On removing the skin, the tumor presented the same aspect

as it does now, irregular in shape, soft at places, hard at others, and giving in some parts the sensation of a collection of pus underneath. The cavities of the alveolæ are all filled with new growths, somewhat hardened, showing on their lower surface the marks of the lower molar teeth. The second cavity, from which a healthy tooth had recently been extracted, was filled with partly masticated food; the palate bone is diseased in its whole extent and the mucous membrane of the regions on the opposite side is separated from the teeth by an accumulation of pus extending more or less into the alveolæ on that side. Sections being made through the head a little on one side of the median line, show the septum nasi healthy, and this being taken off allows a full view of the nasal cavities.

On the right side, in the meatuses, in the cavities of the turbinated bones, in the sinuses, you will observe several malignant growths of various sizes extending back into the fauces and closing them, thus interfering with respiration during life. A similar condition, though less marked, is also found on the left side.

The diagnosis of cancerous disease was then made too evident, and it remained for the microscope to establish the true nature of the malignant process of that specimen.

Dr. Peabody, to whom I referred that investigation, kindly consented to examine various pieces taken from the alveolar cavities and from the tissue forming the growth on the outside of the face; and came to the conclusion that it was not a case of osteosarcomatous degeneration, as I thought, but one of carcinomatous development,—a fact after all which can scarcely convict me of error, both diseased processes being malignant in their characters, and which certainly does not in any way alter my prognosis of the case.

What is generally known in veterinary science as osteosarcoma I have met four times, and I doubt if any veterinarian would not have made the same diagnosis, unless microscopic examination was made; a lesson which I have received in this case, and that I will not forget. I hope other veterinarians will profit by it also, and investigate into the microscopical nature of similar tumors before arriving at a final conclusion.

COMPARATIVE HELMINTHOLOGY.

A CISTICERCUS TENUICOLLIS IN AN ADDAX ANTELOPE AND A MOOSE.

BY THE SAME.

About seven months ago an addax antelope was found dead at the menagerie of the Central Park. She had been sick for a few days with diarrhoea, loss of appetite, &c., but her disease had not been diagnosticated, and Mr. Conklin, the Superintendent, sent her to the American Veterinary College for post-mortem. A careful examination failed to demonstrate any cause of sickness except in the abdominal cavity. On the opening of this part of the body the great mesentery, which was spread over the whole intestinal mass, was found covered with a large number of little bladders, varying in size from that of a small pea to that of a lady's apple—some pedunculated, others closely adherent to the peritoneum. They contained, visible to the naked eye, little white bodies adherent in many places to the walls of the cyst. In removing the omentum and exposing the intestines, these were found also covered with similar cysts—some collected several together, others single, and a large number of these were found loose, floating in the peritoneal fluid. All the organs were found healthy except the liver, which presented on its surface a few cysts, imbedded in the thickness of the capsule of Glisson. A diagnosis was made accordingly.

On the 28th of Aug. I received word from Mr. Conklin to call at the menagerie and look at a moose which had been sick for three or four days. Her appetite had been failing by degrees, she had lost considerably in flesh, and was suffering from severe diarrhoea also. When I made my visit about an hour afterwards, I found the animal had died but a few minutes before.

Our arrangements were made to have her at once brought to the American Veterinary College, where post-mortem was made immediately.

The only lesions which she presented were entirely similar to those found in the antelope. Same arrangements of the cysts, also in large numbers; some loose and others adherent, here a few small ones, there a number attached together, as in grapes. The liver presented also a number of them, and were in general aspect entirely similar to those of the former case. The cause of death was made as due to the presence of the *cysticercus tenuicollis*.

Some of them were sent to Dr. Birdsall, Professor of Helminthology, to the College, and the following is the answer made to our inquiries as to the true nature of the parasites:—

MY DEAR DOCTOR:

The two specimens which you sent to me for examination I will designate as No. 1 and No. 2. No. 1 proved to be one hydrated cyst (*echinococcus*; and they are now all referable to *Tœnia echinococcus* as their mature form; to specify zoological varieties is no longer necessary). It was of the multilocular variety, presenting the exogenous and the endogenous forms of growth. The cyst which you sent was about the size of a hen's egg, irregular in outline, with protuberances upon it (exogeneous masses); and one section was seen to be filled with a slightly gelatinous fluid, and great numbers of smaller sacs, from the size of a mustard seed to that of one which filled one-half the large cyst. Most of these were collapsed and detached, at their place of attachment calcareous masses being found. Thus, these cysts were well advanced in degeneration. The walls between some of these cysts consisted of firm connection-tissue, so that an alveolar appearance was presented. Taking a small cyst: on account of its transparency I found by microscopic examination a number of *echinococcus* heads on the inner surface. They were usually detached, and presented a granular appearance. The circlet of hooks could still be made out, but the exact number was difficult to obtain; twenty-eight could be counted with certainty, arranged in two rows alternating with each other and leaving both of nearly the same length. The average width of the circlet of hooks is 04 m. m., occupying about one-third of the diameter of the head. The average length of the hooks is 0192 m. m.

I present a sketch of one of these heads as seen from above (No. 1, a), another as seen from the side (No. 1, b); in both of which the circle of hooks can be seen, and also a view of detached hooks as they lie in different positions (No. 1, c).

As the number of heads in a small cyst not larger than a pea was often five or six, and as the number of cysts in the single mass which you sent was over fifty, the whole number of heads in this portion above must be many hundred.

Specimen No. 2 consisted of several cysts of variable size, attached to a common preclicle, and formed of connective tissue. Imperfect staining (on account of the specimen not being fresh) with silver nitrate, showed the existence of lymphatics, and a rather doubtful appearance of an endothelial layer. On opening one of these cysts carefully, it was found to enclose another cyst whose contained fluid distended both. This latter one was free, and terminated in a neck, capped by a white head bearing the proportion shown in drawing No. 2, a. The thin membrane which composed the sac was not fresh enough to yield satisfactory results with silver nitrate. The fluid within the sac was of a dark brown color; it contained albumen in a small amount and considerable amorphous material; some imperfect crystalline forms, the nature of which I am ignorant of; also mycelium of a form of fungus.

The head was inverted, like the finger of a glove doubled partly outside in, which gave an external transverse fissure that could be penetrated by a fine needle. The head was filled with calcarious granules; as proved by the solution of carbonic dioxide on the addition of acetic acid. I must confess that I was unable to perceive a circle of hooks, though the characteristic transverse rugæ in the neck was very distinct, and the whole appearance shows conclusively that we have to do with a *cysticercus*.

I am disposed to refer it to the *cysticercus tenuicollis*, on account of the variable and large size of the cysts, some of which were as large as a hen's egg; also on account of the manner of growth and attachment resembling somewhat an *ecchinococcus* cyst, for which they have often been mistaken, as was long ago pointed out by Küchenmeister. The form and appearance of the

head and neck favors this view, also its attachment to the mesentery. It is, besides, a wide-spread form among the lower animals.

Yours respectfully,

W. R. BIRDSALL.

The death of the two valuable animals, likely to be followed by that of others of the same family, which are kept in close proximity to the ground where these were placed, induced me to inquire as to the cause of the presence of the parasites and of the source whence they came. Suspecting that the tape worms which they give rise to, might be the cause of it, and that these tenias being deposited in the food, grass or water these ruminants partook off, I suggested the propriety of examining the rats which crawl about those places, and to see if in those I could not find the starting cause of the trouble. After waiting a few days a rat killed on those grounds was brought to me. Mr. A. McKenzie, student at the College, made a careful post-mortem examination of its whole intestinal canal, and the result was the discovery of a large number of tape worms, the true nature of which however, Dr. Birdsall is inclined to consider as of a different origin than the *cysticercus tennicollis*. Further investigations remain to be made, and if the two parasites can be connected, the remedy is plain of itself; get rid of the rats and the ruminants will escape the fearful death which threatens them. But unfortunately the advice is much easier to give than the application is to follow.

AZOTURIA, OR POISON

BY TINCTURE OF CANTHARIDIS.—DEATH BY LACERATION OF THE
BLADDER WITH A BLUNT INSTRUMENT.

BY C. H. PEABODY, D.V.S.

(*Read before the United States Veterinary Medical Association.*)

Mr. President and Gentlemen of the Association :

The case I am about to describe to you was of much interest to me, and I hope it may elicit some remarks as to the treatment

I pursued, and some discussion as to the correctness of my diagnosis.

On July 25, 1879, I was requested by Mr. Ritchmond, of Pawtucket, to see his mare. On my way to the stable I got the following history :

“The mare is dark brown, seven years old, weighs ten hundred and fifty, stands sixteen hands high. During the last year, about once a month, she has had what I called inflammation of the kidneys. The last attack occurred three weeks ago. A fortnight ago she had what I thought to be lung fever. I treated her and thought she was doing well, but last Tuesday the mare lay down and I cannot get her up. First,” said he, “I gave aconite and belladonna, but afterward I gave $\frac{3}{4}$ vi. of sweet spts. of nitre, every day for three days. Then, thinking she required a stimulant, I gave $\frac{3}{4}$ iii. of the tincture of cantharides in a pint of water, for four days in succession.”

At the stable I found the mare on her off side, moving her fore feet to and fro, but she had neither sensation or motion in the posterior extremities. The pulse was 96; respiration, 60; temperature, 107; the visible mucous membranes were dark brown. There was no swelling of the extremities, or of any part of the head or body, and percussion and auscultation of the chest did not indicate any trouble there that I could find, as she lay. On examination I found the rectum filled with hard and dry fæces, and passing the catheter I drew about three gallons of thick, bloody and sour-smelling urine. Diagnosis: poisoned by cantharides. Prognosis: doubtful.

TREATMENT.—I prescribed oleum lini one pint, soda bicarbonate $\frac{3}{4}$ iv., in solution every three hours, until $\frac{3}{4}$ iv. should be given, linseed gruel to drink, and ordered the mare to be turned over during the night. July 26. Pulse, 80; respiration, 60; temperature, 106; the membranes are dark brown; I emptied the bladder of about two gallons of urine, lighter in color than the day before, and less sour in smell; the rectum was full of dry fæces; very little sensation over lumbar region. With slings I got the mare up and had the extremities well rubbed; she then tried in vain to micturate, and to overcome the straining, I introduced into the vagina a

suppository of solid extract of belladonna ʒ ii. The straining stopped in about three quarters of an hour. I then gave oleum lini ʒ iv., and the solution of soda every eight hours. The mare was fed with grass and cooked oats.

July 27th.—Pulse, 60 ; respiration, 48 ; temperature, 104. The general appearance of the animal is much improved ; the urine quite light in color and not so thick ; the fæces are soft. I discontinued the soda and gave alcoholic stimulants.

July 28th.—Pulse, 48 ; respiration, 36 ; temperature, 102 1-5. The visible mucous membranes are of a lighter color. She stands without slings. Same treatment.

July 29th.—Pulse, 48 ; respiration, 36 ; temperature, 101 3-5. The mare passes about a pint of urine, light in color, every two hours ; fæces nearly normal.

July 31st, received telegram mare worse. I found her with a pulse of 72 ; respiration, 50 ; temperature, 105 2-5. Contrary to direction, the mare had been fed hay and raw oats, and had received some medicine from her owner. She was straining, and voiding bloody and turbid urine. The fæces were very dry and hard, and covered with a bloody slime. There seemed to be a general loss of strength, and in my perplexity I tried the effect of spirits turpentine ʒ i. every three hours in oil ʒ iv., with another suppository, and left the mare, expecting to make a post-mortem on the morrow.

August 1.—Pulse, 60 ; respiration, 40 ; temperature, 103. The straining gradually diminished after my departure and was succeeded by a profuse perspiration, which dried off about midnight. At 2 A. M. the mare drank half a bucket of gruel, and in the morning ate a few boiled oats. The urine is quite thick and streaked with a yellow pus ; the fæcis are hard and covered with a yellow slime. I prescribed fluid ext. ergot ʒ iv every six hours with a stimulant boll. ammo. carb, ʒ ii, gum camph. ʒ i, pulv. barb. aloës ʒ i, pulv. gentin ʒ i, one every eight hours.

August 2.—Pulse stronger, 50 ; respiration, 32 ; temperature, 102 ; urine quite clear ; fæces soft. The body of the mare feels greasy ; over each eye and external angles of the ilium abscesses are formed from which two to four ounces of fœtid pus escaped when opened.

August 3.—Pulse, 40 ; temperature, 101 3-5 ; respiration, 20. The mare appears better ; alcoholic stimulants resumed.

August 5.—Pulse, 40 ; respiration, 30 ; temperature, 100 2-5. The urine and fæces about normal. A slough has taken place over the iliums, to which sulphur and alum has been applied. The hair over the body is peeling off, leaving a smooth black surface.

August 15.—Pulse, 36 ; respiration, 18 ; temperature, 100. She feeds well and takes an hour's exercise every day ; very fine hair is beginning to appear over the body.

September 1—Mare turned to pasture.

October 1—She was put to work ; the hairs of the mane and tail have come out. The body is covered with a light brown hair.

This, gentlemen, is the end of the case which it was my purpose at the outset to present. But, in conclusion, I will abridge from my note-book the fate of the mare. On the evening of December 5th, the owner, in attempting to pass a catheter, lost it, and at two o'clock of the following morning, December 6th, I was called to visit the mare and, if possible, recover the instrument. On examination, I found the bladder punctured in two places. The animal was at once destroyed. In the post-mortem made at three A. M., by the uncertain light of a lantern, I found the mesentery and colon ruptured and a rectal tube nineteen inches in length which had been used for a catheter, lying at the posterior face of the diaphragm. My purpose, now, gentlemen, in thus minutely describing the history of this case and treatment, has been to receive and not to impart knowledge. I have once more come as a scholar from my village to this metropolis. Was this a case of azoturia, associated with influenza or some form of lung trouble ? or, was it inflammation of the kidneys and spasms of the neck of the bladder induced by large doses of cantharidis ? or, did it arise from long continued and improper administration of medicines ?

EDITORIAL.

EPIZOOTIC INFLUENZA AND ITS SEQUELÆ.

Another outbreak of epizootic influenza has made its appearance in different parts of the United States, and for the last few weeks has created more or less excitement amongst owners of horses. Like that of 1872, it covered quite a large extent of territory, and since its appearance in Boston, where it was first reported in the last part of September, has traveled southward to New York, and we are informed has spread to New Jersey and then to the Western States, and at last accounts was raging in Nova Scotia. Similar to the outbreak of eight years ago, though it appeared later in the season, it followed a period of hot and dry weather and exhibited itself by the usual external manifestations of catarrh of the anterior air passages, laryngitis, cough, nasal discharge, &c. Not so extensive as the first, it nevertheless will, we believe, be accompanied with more fatal cases, and has presented also more varied forms of complication. For instance: in Boston abdominal sequelæ, we understand, have been quite common, and though this was also met now and then in New York, still in this last city, a more fatal disease has followed and carried with it a large number of horses, a state of things which can be easily understood from the fact that the people, not realizing the weakening influence the disease had on the animals, these were kept at work though entirely unfit for it. Purpura hemorrhagica has been and is now prevailing in New York City to an alarming extent, especially so, if it should develop itself amongst the numerous valuable trotting horses which are owned in this great metropolis. An idea of the mortality resulting from this sequelæ can be obtained by the imperfect statistics gathered by some of the students of the American Veterinary College made from inquiries at the rendering dock in this City. At several visits made to that establishment, where the number of dead horses were received, the following figures were obtained:

For the 24 hours ending Oct. 18th, 7 A. M., out of 54 cadavers, 40 presented the external lesions of purpura.

For same period ending Oct. 19, out of 36 cadavers, 17

"	"	20,	"	16	"	8
"	"	22,	"	37	"	18
"	"	23,	"	15	"	7
"	"	25,	"	26	"	14

a total of 104 out of 184 dead animals, or an average of $56\frac{1}{2}$ per cent.

Showing, as this no doubt does, the severity of this disease, it would be very interesting to have similar statistics obtained in other cities and to have them recorded. They would go far in proving to our horse owners that though the disease as it appeared first was not a necessarily fatal affection, it nevertheless rendered the animal unable to perform any kind of work, and by its debilitating influence make him predisposed to contract other forms of disease as long as the blood remained loaded with the poisonous element which accompanied these species of afflictions.

VETERINARY COLLEGE OPENINGS.

Like medical schools, veterinary colleges have resumed their work, and once more for several months the halls of the different institutions will be filled by students who are desirous to obtain a medical or veterinary education. Medical schools have no reason to complain of the attendance on their lectures, for the number of students can be counted by hundreds and some of them have scarcely room enough for the new applicants. Veterinary colleges are not as yet in the same flourishing condition. But the time is certainly coming very fast when the buildings our veterinary faculties occupy will be found too small and their accommodations deficient. This applies specially to the American Veterinary College, which reopened its course of the first of October, before a large audience, who had come to hear the introductory lecture, which was delivered by Prof. J. L. Robertson. Some changes have been made in the faculty of the college, and while some great losses

have been sustained, the appointment of new professors and lecturers, men of known ability in their specialties, will well fill the places of those who, by unavoidable circumstances, have separated from the institution ; and, if we can judge by the attendance present, the officers of the college will have no reason to be dissatisfied by the success of the season of 1880-81.

HUMAN AND ANIMAL VARIOLÆ: A STUDY IN COMPARATIVE PATHOLOGY.

BY GEORGE FLEMING, F.R.C.V.S., ARMY VETERINARY INSPECTOR.

(From the Veterinary Journal, London, England.)

(Continued from p. 292).

I have alluded to the experiments carried on in Italy from 1871 to 1874, with a view to decide the question as to the value of animal and humanized vaccine. On referring to the report,* I find the Commission was composed of a President and five members of the medical profession, one of whom was Professor Bassi, a very distinguished teacher in the Turin Royal Veterinary School, and a Secretary. Permission was given to make use of the cattle on the royal farm at Turin ; and the children in the Foundling Hospital, as well as the soldiers of the garrison, were made available in these experiments. Sixty-one cattle—chiefly cow-calves and heifers—were utilized, and the inoculations were made by puncture and incision, chiefly on the udder, seldom on the labia of the vagina. One side was, in most cases, inoculated with animal, the other with humanized lymph. This lymph was either that of natural cow-pox, artificial cow-pox (transmitted from cow to cow), humanized vaccine transferred to the cow ; lymph transferred from arm to arm ; or horse-pox, from a natural outbreak of the disease in horses.

* *Esperienze Comparative sul Vaccino Animale e sull'Umanizzato. Relazione Commissione, etc. Torino, 1874.*

It is very important to note that two experiments were made to test the transmissibility of human syphilis to calves. At the seat of inoculation there was formation of pustules, induration of the udder and the lymphatic glands, which continued for about a month ; but otherwise the animals remained in good health.

The conclusions arrived at by the Commission were as follows :

1. The results of inoculation by puncture and incision are the same, though in the thicker skin of adult man or bovines incision is preferable ; for children puncture is not so painful, and takes less time. Incision alarms the mother, as it causes a little bleeding.

2. The time of year has no marked influence on the success of vaccination or re-vaccination, though temperature will hasten or retard the appearance of the eruption.

3. The form of pustulation is in man and animals essentially the same, except that in cattle there is less lymph, and the umbilicated appearance of the pustule is not so distinct.

4. The lymph from different sources has not the same potency. In horse-pox, 72.9 per cent. of the inoculations were successful ; in natural cow-pox, 72.8 ; and in artificial cow-pox, 44.19.

5. Humanized lymph has double the potency of that from animals.

6. Humanized lymph conveyed to cattle diminishes in activity.

7. Natural cow-pox lymph inoculated on mankind increases in potency.

8. Comparison of the primary lymph with that of re-vaccination is greatly in favor of the former.

9. *Human small-pox cannot be transmitted to cattle.*

10. The syphilis virus can be implanted in bovines, and successfully re-transferred to man.

11. Humanized lymph possesses more tenacity of activity than any other ; with properly preserved crusts or dry lymph, animals can be inoculated successfully.

12. Lymph is more easily procured from man than from animals.

13. The microscope gives no indication of the activity of lymph.

From what I have now stated, I think there are few who will continue to maintain that human variola and cow-pox are one and the same disease—*i. e.*, cow-pox being merely small-pox transferred to the cow; or that there is any relationship or resemblance between them, except in so far that they are eruptive, run a certain course, generally attack the organism only once in a lifetime, and are antagonistic to each other. It would be strange, indeed, if the virus of small-pox could be so changed that, by being passed only once through the system of the cow, it should completely lose its identity and never regain it, no matter how long it might afterwards be cultivated in its native soil; and that, while before it could only be successfully transferred with the utmost difficulty to bovine animals, and perished in two or three removes, it should be capable, after its transmutation, of not only preserving its new characters of peculiar localized eruption and non-infectiousness, but also retain all its potency after endless transmissions through human, bovine, equine, and perhaps other animal species. “The poor unfortunate cow” is certainly not the victim of human variola, as was asserted with more sentiment than accuracy at the conference, by a speaker who, nevertheless, confessed he had not succeeded in his attempts to produce vaccinia from small-pox.

Taking up this position, and supporting it by ample evidence, the knowledge we possess of virulent diseases in general, as well as the fact that the most extensive, careful, and exhaustive experiments by the ablest pathologists have failed in transmuting variola into vaccinia,* I may be asked how we are to account for the

* Mr. Ceely himself affords us almost conclusive evidence as to non-identity between human variola and vaccinia, in the extreme difficulty, according to his own showing, with which the former could be transferred to bovines, and the remarkable facility with which the latter was propagated by the milkers. He says that in December, 1838, on a large dairy farm where there were three milking sheds, vaccinia first appeared in the home or lower shed. The cows in this shed being troublesome, the milker from the upper shed, *after milking his own cows*, came to assist in this for several days, morning and evening, when in about a week some of his own cows began to exhibit the disease. It appears that, having chapped hands, he neglected washing them for three or four days at a time, and thus seemed to convey the disease from one shed to another. During the progress of the disease through this shed, one of the affected cows, which had been assailed by its fellows, was removed to the middle shed, where all

success of two or three persons in this direction many years ago. We may, if we choose, refer to the Lyons Commissioner's experiments and explanation for a reply, and conclude that the small-pox transferred to the cow remained small-pox still, though it was so modified in virulency, when re-transferred to man, as to produce at first only a local eruption, though in some instances small-pox in a mild form followed. If I mistake not, more than one instance is on record, in which medical men have imitated Ceely and Badcock, and re-inoculating children from the cow, have produced nothing but small-pox. Among other instances of this kind, I may refer to that of Martin (*Boston Medical Journal*, 1860). That practitioner inoculated the udder of a cow with small-pox matter, and thought he had produced cow-pox. Collecting what he believed to be vaccine lymph from the vesicles, he vaccinated about fifty children with it, but produced only a serious outbreak of small-pox, from which several died. And a similar, but more alarming occurrence took place in India. Even in one of Ceely's reported successful cases of vaccinia produced by variolation, we are informed that his assistant, in opening the supposed vaccine vesicle due to the small-pox virus, accidentally punctured his hand with the lancet, charged with moist lymph. On the fourth day there was a hard, deep-red, papular elevation at the seat of puncture. This was followed by constitutional disturbance—as "headache and other febrile symptoms, with roseola and fiery red papulæ on the face and other parts." On the sixth day the constitutional symptoms were more intense, and the papulæ on the face, neck, trunk, and limbs exhibited ash-colored summits on the seventh day, and the febrile symptoms were abated; on the eighth day, the papulæ were more yellow, and some were desiccating, but headache was still present.

But if it is admitted that if it was really cow-pox Ceely and

the animals were perfectly well. This cow, being in an advanced stage of the disease, and of course difficult to milk, was milked first in order by the juvenile milker, for three or four days only, when, becoming unmanageable by him, its former milker was called in to attend exclusively to it. In less than a week all the animals in this shed showed symptoms of the disease, though in a much milder degree than it had appeared in the other sheds, fewer manipulations having been performed by an infected hand.

Badcock contrived to transfer to children, might it not be suggested that in all probability the animals from which they transferred it were accidentally infected with the natural malady at the time they were inoculated with the small-pox virus?

Cow-pox was far more rare in those days, and many might be inclined to conclude, that if the animals supposed to have developed vaccinia from small-pox were not inoculated with small-pox lymph by mistake, they were already infected with cow-pox, from which children were subsequently vaccinated. Ceely himself admits (*Transactions of the Provincial Medical and Surgical Association*, vol. viii. p. 378) that cow-pox was prevalent in the locality when his experiments were undertaken, and he also states that in the only two instances in which he succeeded in producing vaccinia by variolation, *the animals were also vaccinated quite close to the inoculation punctures*; while with a third heifer experimented on at the same time, *but which was not vaccinated*, there was no result.

It is somewhat extraordinary that, considering the grave issues at stake, Mr. Ceely has not been prevailed upon to undertake further experiments, and to repeat that success which could not be achieved by any subsequent experimenters, though they had the advantage of far more abundant means and facilities. Surely if, as has been asserted, cow-pox could be so easily produced accidentally, by contact with small-pox-infected people at the commencement of this century (though there is no proof of this), it should be as readily developed now, experimentally or accidentally; and especially when we find that vaccination—which some authorities say is only variolation—is easily and certainly practiced in the bovine species. According to his own statement, Mr. Ceely only succeeded twice, under the conditions mentioned above, in producing vaccinia from small-pox, though his experiments appear to have been numerous. All subsequent attempts of most careful, skilled, and patient investigators have failed.

But if the views I entertain are well-founded—and reasoning and facts are altogether in their favor—vaccinia cannot be developed from human variola; the two are distinct and special infections—as distinct as two individuals of the same species. Vaccinia

is as much a disease of the bovine species as small-pox is a malady peculiar to man—each is a special form of variola, and exists and prevails not only independently, but marked with all its own particular characteristics and attributes. Both attack males and females, in direct proportion as these are exposed to contagion.

The symptoms of small-pox in mankind are well-known. Not those of vaccinia, however, though Ceely has described what he designates the “natural disease” very clearly.* If we study the symptomatology in a large number of cases artificially produced by inoculation with humanized vaccine lymph—no matter in what region of the ox the virus has been deposited, we shall find a remarkable constancy and regularity.

After the second or third day there is seen in a white-skinned animal at the seat of puncture, a small red papule which, on the third or fourth day, is somewhat large and prominent, rather pale, surrounded by a bright-red areola, and slightly depressed in the centre. From the fourth to the fifth day, the papule, now a vesicle, has a well-defined umbilicus, a marked areola, and an elevated margin. These characters are all the more developed towards the eighth or ninth day, when they begin to subside; the pustule becomes brownish-color in the centre, and yellowish or necrotic towards the margin. Desiccation has begun; the brown tint gradually invades the entire surface; the areola disappears; the prominence of the pustule is diminished; and towards the twelfth or fourteenth day nothing usually remains except the crust, which

* It must be remembered that at that time very little was known of animal diseases, or of the history of those wide-spreading destructive epizooties which have only been carefully studied within the last few years. We need not be surprised, therefore, to find grave mistakes committed with regard to bovine diseases, up to quite recent times, nor need we wonder at Mr. Ceely speaking of malignant vaccine, and even variola appearing in cattle. In the same volume in which his observations appear, is a report on vaccination, drawn up by a medical committee; and the superstructure of the report is based upon the supposition that the cattle-plague which had repeatedly visited this country, raged on the Continent, and was seen in India, was only variola—*variola vacciniæ*—which, transferred to mankind, conferred immunity from small-pox! The same blunder was made in 1865, when cattle-plague was destroying our herds, and vaccination was resorted to, to stay its ravages.

falls about the fifteenth to the twentieth day, leaving only a slight, but permanent cicatrix.

The same changes occur in a dark skin, but they cannot all be so readily perceived, in consequence of the pigmentation.

The size and prominence of the pustules may, of course, vary, and their base appear more inflamed in some cases than other, according to constitution, condition of the animal, and other circumstances: the evolution being generally most notable in those which are in good health. The virus seems to be most active towards the sixth or seventh day after inoculation, and then rapidly loses its potency. Indeed, it has been found that though there is then not so much lymph as afterwards, between the third and seventh days is the period when it is most potent.

As a rule, there is little or no general disturbance of health perceptible; and though in the natural disease a more or less generalized eruption has been observed in rare instances, yet it has not been noticed in the artificially induced malady; while it has not been at all unusual to discover a kind of secondary eruption, of exactly the same character, around the inoculation points—an eruption which might be due to accidental inoculation when the operation was performed. In the experiments of the Lyons Commission, a young bull, successfully inoculated in three places on the scrotum, on the sixth day had a newly-developed pustule behind one of the places. This had all the characters of the others, and though its presence was attributed to auto-inoculation, yet there was no certainty that it was so produced.

The natural cow-pox I have described in my work on "Veterinary Sanitary Science and Police" (vol. ii., p. 91). The symptoms and course of the disease may be briefly described as follows: After slight febrile disturbance, partial loss of appetite and suspension of rumination, trifling constipation and diminution of the urinary secretion—symptoms which may, nevertheless, be absent or unperceived—and lessened quantity, as well as altered quality of the milk (more aqueous and disposed to coagulate than usual), the udder is observed to be swollen, particularly near the teats, and is painful during milking. In two or three days there are seen on the udder, and chiefly on the teats, small hard tumors, varying

in size from that of a pea to a haricot-bean, and of a pale-red hue. Increasing in volume, a viscid yellow fluid appears beneath the epidermis. At first this fluid is in the centre, but it soon extends towards the circumference, giving the nodosities or papules a light-blue tint in the middle, but a reddish-blue or yellow color towards the periphery. At this period the centre is also usually umbilicated or depressed; the margin is hard, tumefied, and painful; and when the skin is thin and transparent, a red areola is noticed. These "pocks" gradually increase in dimensions, and towards the eighth or tenth day have acquired their maximum development. On the udder they are generally circular; on the teats they are oblong. The contents then become purulent in character, and a crust begins to form in the centre, gradually extending to the circumference. This crust is thick, shining, and deep brown or black in color; it is firmly fixed to the skin, from which it does not become detached until the tenth to the fifteenth day, unless accidentally removed. When it has fallen off, it leaves a cicatrix, which persists for a considerable time, and is at first bluish-red in color, but gradually becomes pale. On the udder the cicatrix is depressed in the centre.

In the same animal there may be successive crops of papules and pustules; they may not all be developed simultaneously, some being crusted, while others are only nodes. The latter eruptions may, however, be due to re-inoculation during milking; this is favored by the existence of sores or fissures on the teats. In consequence of this circumstance, the malady may not pass through all its phases within a less period than a month or six weeks. The lymph taken towards the eighth or tenth day is most active for vaccination purposes.

The variable color of the vaccinal pustules is not an essential characteristic of the disease, and does not therefore indicate the real nature of the eruption. If the skin is fine and white, the variolæ have a silvery-white, bluish-white, or slatey hue; if it is thin but dark colored, they are leaden-grey; if the hair is of a bright shade, they have a color varying from a bright-red to a pale or blood-red tint, but always wear a metallic lustre. On a thick, white, and wrinkled skin they have a dull opaline lustre.

In exceptional cases there is somewhat severe constitutional disturbance before the eruption appears. For instance, in the Wurtemberg Veterinary Reports for 1877, mention is made of a cow which showed a rather high degree of fever: hot skin, quickened respiration, horripilation, and rigors from time to time. On the four teats appeared more than a score of pocks; these contained a very small quantity of thick lymph, some of which was preserved in capillary tubes, and another portion removed by means of a fine hair-pencil and kept in glycerine. These portions were successfully employed in vaccination. The owner of the cow was accidentally inoculated through milking the animal, a large pock forming on his hand.

In studying cow-pox, it must not be forgotten that there is a spurious vaccinia, sometimes designated *vaccinella* or *vaccinoides*, a disease, or several forms of disease resembling cow-pox to some extent, but yet differing from it in several important features. It is generally observed soon after calving, and would seem to be contagious, as it attacks nearly all the cattle in a shed when one cow becomes affected. It appears to be very uncertain in its transmission to mankind, and to be also more or less enzootic. The symptoms are much like those of cow-pox, the only important differences being in the character of the exanthem, and the lesser degree of virulency of the infecting agent. The eruptions of spurious vaccinia are divided into three groups. One consists of acuminate papules or pustules, which may or may not be developed at the same time as the true pock; they appear as small red nodes about the size of a grain of millet, destitute of areola and umbilicus, and soon changing into a conical pustule, the contents of which quickly desiccate, and form a crust—the whole process only occupying from four to six days. The eruption may appear several times, however, so that the entire period will extend over a number of weeks. The second group is composed of hard indolent tumors, the so-called *steinpocken* of the German veterinarians; they vary in size from that of a pea to that of a nut, are somewhat red at first, and have no areola; or they may appear as a kind of warty excrescences on the skin of the udder. They frequently remain unaltered for weeks, or

even months, and at last disappear very slowly. Emphysematous and watery vesicles constitute the third group. They first appear on the udder in the form of red spots, which are rapidly transformed into vesicles ranging in size from a pea to a cherry, but destitute of areola and umbilicus. They contain a serous or purulent fluid, are readily broken, and are covered by very thin crusts, which soon fall off. Frequently their contents are quickly absorbed, leaving only an empty epidermic envelope, which constitutes the emphysematous pock. They pass through all their phases within five or six days.

Such is cow-pox, as we know it at the present day, and its course is exactly that of human vaccination with Jennerian vaccine, which is in reality nothing more or less than the cow-pox transmitted through very many successive generations of mankind. The vesicles of vaccinia has been simply transferred from the cow's udder or teats to the human arm—there is nothing whatever of small-pox in it.

(To be continued.)

INTERNATIONAL CONGRESS OF HYGIENE AT TURIN—VETERINARY SECTION.

President—Mr. Vallada. Vice-Presidents—M.M. Basso, (Turin); Cocconi, (Rome); Prof. Nocard, (Alfort); Dr. E. Perrin, (Paris).

(A.) Mr. Felix, of Bucharest, presented a publication on the utility of a sanitary inspection of meat.

After long discussion the following resolution was adopted:

1st—That a veterinary service of inspections of meat be established whenever there is an abattoir or slaughter house.

2d—That the inspections be made on living animals and repeated after death.

3d—That popular instruction be given to persuade the people that insufficiently cooked meat may sometimes be dangerous.

(*B.*) Prof. Basso asked for a regular disinfection of wagons on railroads used for the transport of cattle, so as to avoid the diffusions of contagious diseases.

The following resolution was then admitted : That the regular disinfection of wagons and trucks, whenever they have been used for the transport of solipeds, large or small ruminants, swine or poultry, is a very important measure of sanitary police, to prevent the spreading of contagious diseases of domestic animals, and it is to be hoped will be adopted by all governments.

(*C.*) The section discussed the etiology and prophylaxy of hydrophobia amongst animals in relation to public health.

The discussion was closed by the desire expressed by Prof. Vallada, that practical studies will be made to establish the fact, that the bite of a healthy dog may give hydrophobia, though the dog is free from it, a fact not admitted by scientists, but which has been reported by some observers.

(*D.*) After remarks from MM. Basso and DeMarchi, the vote was taken and carried on the two following questions : Colleges are invited to study if there is not a form of curable rabies, which can transmit by bite a fatal hydrophobia, and that during the period of incubation of rabies, the dog ought always be considered as able to transmit the disease at any time, ignorant as one is when that time may come.

(*E.*) Prof. Brusasco speaking of the transmission of glanders to man and of the prophylactic sanitary measures concerning it, the vote was carried that ; As glanders of solipeds can be transmitted to man, by inoculation or infection, it is proposed that every government renders the destruction of glandered animals immediate, that those animals will not be submitted to treatment except in veterinary schools, and that by popular instructions people will be notified of the danger resulting from the exposure by coming in contact with such animals.

(*F.*) Mr. Brusasco treated of the questions of the transmission of the tuberculosis of animals to man.

Mr. Bassi did not admit as being scientifically proved that the tuberculosis of cattle is identical with that of man.

MM. Nocard and Bizzozero protested against this opinion.

The following vote was carried: Considering the probable identity of the tuberculosis of cattle with that of man, and of the possibility of the transmission of the disease by the use of meat and milk, of tuberculous cows and other animals, especially if improperly cooked, all governments are solicited to take very severe measures of sanitary police, and to instruct the public of the danger, so as to avoid the transmission of that disease from animals to man.

(*G.*) Mr. Gay, secretary, read for Mr. Brusasco a note on the transmission of anthrax from animals to man, and on the measures necessary to prevent that contagion.

After a long discussion, it was voted that in case of death of carbunculous animals:

1st. That the cadavers be boiled in traveling furnaces in localities where there are no rendering yards.

2nd. The torrefaction of the soil of barns, with the disinfection of all material affected.

3rd. The covering of the soil of barns with a coat of asphalt.

4th. The establishment of stations for the burying, with previous boiling, of animals dead from anthrax or from other diseases which render them unfit for food.

(*H.*) A work from Prof. Basso on the different species of scabies communicable from man to animals, being read, it was proposed that popular instructions be given concerning these diseases.

EXTRACTS FROM FOREIGN JOURNALS.

CASTRATION BY ELASTIC LIGATURE.

BY M. TAYSON, V.S.

After mentioning the magnificent extracts obtained by Mr. Guerin and Rossiñol, and encouraged by the flattering reports published, the author gives an account of his experience with this new mode of operation, with the success and failure he had met

with, and compared them with the old-fashion of castration, which he had used on previous occasions, giving the following résumé of the results he had obtained :

CASTRATION WITH UNCOVERED TESTICLES.

Year.	Horses Operated.	Death	Nature of Disease.
1875.	About 30.	2	Peritonitis.

CASTRATION WITH COVERED TESTICLES, BY CLAMS.

Year.	Horses Operated.	Deaths.	Nature of Disease.
1876	About 200	3	1 Gangrene.
1877			
1878			1 Champignon.
1879			
1880			1 Indirectly.

The third death seems so indirectly connected with the operation, that it might not be counted (swelling of the penis.)

CASTRATION WITH COVERED TESTICLES (Elastic Ligature).

Year.	Horses Operated.	Death.	Nature of Disease.
1879	20	7, viz.	4 Tetanus.
1880	Besides 4 Bulls,	5 Horses	
	1 Ram.	1 Bull. 1 Ram.	3 Gangrene.

—*Archives Veterinaires.*

INTUSSUSCEPTION CONSECUTIVE TO A GANGRENOUS SWELLING.

BY M. LEMONNIER.

A sorrel mare, 5 years old, had died from a wound. The history is that about ten days ago she was stabbed in the back by her driver. Four or five days later a large œdema took place, accompanied with flow of serosity. Shown to a veterinarian, a resolute friction was applied without result, and the mare died a few days after, though the day of her death she had been at work, and showed signs of sickness only in the evening, when she had violent colics.

At the autopsy, the body was found very tympanitic. In the middle of the back, on the left side, existed an elliptic wound, from which exudated a foetid, grayish liquid, mixed with organic detritus. A probe introduced in the wound arrived on the ribs. The œdema was very large, and extended to the chest, flank, abdomen and inguinal region of that side. It crepitated on pressure. The skin removed, the serosity was found very abundant, the cellular tissue ecchymotic in places and filled with reddish fluid, the muscular and cellular tissue were disintegrated, pulpy, greenish in color and very offensive; they were in a full state of gangrene. In the chest the intercostal spaces were intact, the parietal pleura was red and ecchymosed, the visceral showed the same lesions, less marked. The pleural sac contained a small quantity of fluid. The heart had only a few ecchymotic spots. In opening the abdomen four or five liters of bloody serosity ran out, abdominal organs were much congested, and especially the small intestines. Those organs were yellowish, much ecchymosed and easily torn. Toward the middle of the small intestine an invagination existed, formed by three intestinal cylinders, the two most internal and the mesentery covering them much congested.

The stomach contained only a little semi-liquid alimentary mass. The small intestine contained a small quantity of liquid food, of a brown-red color, which was also found in the cœcum.

The author asks if this case could not be considered similar to others of the same nature, which have been reported as sequelæ of purpura.—*Archives Veterinaires*.

SPRAIN OF THE NECK—RAPID RECOVERY WITH COLD DOUCHES.

BY W. PALAT.

A nine year old mare was found lying on the left side, with the left hind foot caught in the right rope of the halter, the head almost touching the hoof, and resting on the left side of its base in such a manner that the left eye and ear both touch the ground.

The rope is cut, and the animal assisted in getting up. She had a vertebro-cervical sprain.

She presented a large convexity on the left side, the tumor was in the middle of the neck, hard and especially very painful. The head was enormous, infiltrated, the left eye tumified, the upper eyelid the seat of a deep wound, the left ear excoriated, the head so heavy that it is carried low down. Previous to this accident the mare was very quiet, and now she is very ugly and dangerous to approach.

The treatment consisted in bleeding, cold douches on the neck all the time, except during meals. Low diet and laxation.

Improvement the next day—the œdema of the head has somewhat diminished—the neck still largely swollen. Same treatment.

The second day still greater improvement—the convexity of the neck had diminished, the head had better appearance and was carried much higher. Same application.

Five days after the accident, the convexity of the neck has disappeared, and three days later the animal was able to resume work.—*Archives Veterinaires*.

IDENTITY OF THE ACUTE EXPERIMENTAL SEPTICÆMIA AND CHICKEN CHOLERA.

BY M. TOUSSAINT.

About 250 observations allowed Mr. Toussaint to say that chicken cholera is nothing else than acute septicæmia, contracted spontaneously; to take the disease it is necessary that these animals have access to putrified substances. In septicæmic blood, and in the septic virus, which kills rabbits in ten or twenty hours, Mr. Toussaint has found a microbe similar to the one discovered in chicken cholera. By the ingestion of blood of septicæmic substances he has reproduced the symptoms and lesions of cholera in chicken. Mr. Toussaint has found in the putrified blood of carbunculous animals, bacteridies and also the septic microbe; the

first inoculation killed rabbits by anthrax, and later when the bacteridies disappeared, the microbe resisting, the same blood killed hens with all the lesions of cholera. In some animals, on the contrary, such as dogs, sheep and guinea pigs, the bacteridies resist the most; the septic microbe is eliminated, and it is always by anthrax that those animals died when inoculated with that blood.

Mortal septicaemia shows itself even in animals which have not been inoculated, but which have taken septic virus through digestive apparatus; the inoculation has then taken place through lesions of the buccal or guttural membrane. In the point of view of general prophylaxy this is an important discovery.—*Revue d'Hygiene*.

PRIZE ESSAY.

BY J. T. DUNCAN, V.S. (Toronto.)

CONTAGIOUS DISEASES OF CATTLE.

I. PLEURO-PNEUMONIA CONTAGIOSA—INTRODUCTION.

In treating of the contagious diseases of cattle, the one mentioned above demands our first attention; not only on account of the enormous injury it is capable of inflicting on the stock interests of any country to which it is brought—not only because of the prominence given to it by recent events, but because of the *facility with which it may be introduced into a country at present free from it*. This it is which gives to Canada such a vital interest in the disease. We are, and have been, free from its ravages. So long as we remain so, our trade in cattle (now one of the most lucrative and important to the country) will not be subjected to annoyance and loss by legislative interference. While the United States, by gross governmental carelessness, have allowed it to become firmly established in their borders, we are enjoying the ben-

effits of our own precautions in the matter. Our immunity from this plague is a source of gratification, especially to the veterinary profession, and if the Government, in concert with the profession, can preserve to the Dominion a continuance of that immunity, they will deserve the thanks of all.

But we know not how long this condition may remain. Along our southern frontier lies an infected country. True, the west as yet claims exemption, but this fact has not been established by proper veterinary inspection. The inter-state trade is practically unchecked, and the only reason why the west is not affected is the fact of the course of the cattle trade being from west to east. Nor are we in danger of infection from the United States only, but from Great Britain as well.

And other contagious diseases besides the one just mentioned demand our care and vigilance that they may not be brought into the country. To supply the information necessary to guard against such plagues, and to spread information regarding them in an available form, these pages have been written. The more important facts will be stated as concisely and as clearly as possible, while practical matters, as distinguished from theoretical speculations, will receive most attention.

HISTORY.

Although various writers have stated that this disease has existed from time immemorial, no really good account of it was written till the eighteenth century. From the hazy and extremely general description of previous authors, it is difficult to make out of what affection they are writing. Some, however, have supposed that Virgil wrote of pleuro-pneumonia so long ago as before the birth of Christ, quoting, in support of that opinion, a description found in the third book of Georgics. During the eighteenth century it prevailed more or less extensively in Europe, and in 1769 Bourgelat, a French veterinary surgeon, first wrote a good description of it. Not, however, till 1842 was it brought to Great Britain, from which country it has never since been banished. To the United States it "was imported in 1843 and 1850

by Dutch and English cows, and has since silently spread over nearly the whole eastern sea-board." *

ORIGIN.

The question of the spontaneity or otherwise of its origin has been much discussed. Some hold that, given a certain concatenation of circumstances, and it may arise abiogenetically. Others, again, equally good authority, maintain that it does not originate spontaneously. Practically, it may be assumed that any manifestations of it seen in these latitudes are due to *contagion, mediate or immediate*.

This brings us to the question (which has been much discussed) of how the disease can be communicated. Granted that it does not arise spontaneously, is there any other means of its propagation than the actual cohabitation of infected and healthy cattle? Many excellent authorities, as Professors Simonds and Brown, hold that it can be communicated in no other way. Their experiments, as well as those recently tried by Dr. Burdon-Sanderson at the Brown Institute, go far to support this view. This is known as *immediate contagion*.

On the other hand, such able men and high authorities as Fleming, Walley, Williams, and the continental surgeons generally, strongly combat this view, holding that whatever support it may appear to have from experiments, clinical facts prove conclusively that the virus can be carried on hay, straw, manure, various objects in the stable, etc. This is what is spoken of as *mediate contagion*. The supporters of this opinion point to such facts as this: that from a stable in which pleuro-pneumonic cattle were kept, all stock were removed, the stable cleansed and kept empty for months, and perfectly healthy stock, which had no possible communication with the disease in any other way, put in; *these cattle fell victims to pleuro-pneumonia*. Such facts as these are too numerous and well authenticated to be disputed, and leave no doubt of the correctness of those who hold the possibility of *mediate contagion*, unless, indeed, we account for these outbreaks on the ground of the autogenetic origin of this disease.

* Professor Law.

DEFINITION.

It is an insidious, exudative, zymotic disease, due to a specific poison or ferment, peculiar to the ox, and having its local manifestations concentrated in the lungs and pleura.*—(WALLEY.)

PATHOLOGY AND SYMPTOMS.†

There is much variety in the manifestations of the disease. In some instances, more especially during its first outbreak in a district, it runs a rapid course, destroying life in the course of a few days, the lungs after death presenting the appearance of a congestive inflammatory change. In other cases—and these are by far the most numerous—the onset, course, and termination of the disease occupy a period of from four to eight weeks, or even longer, the animal becoming much emaciated and finally succumbing to an exhausting diarrhoea, imperfect aëration of its blood, hydrothorax, or to the depressing influence of degenerated animal matters in the blood, and anæmia.

Premonitory Symptoms.—Similar to the cattle plague, the commencement of the disease is often not observable. Thus attention is only called in many instances to an animal for the first time appearing unwell, but in which an examination brings to light the fact that changes of structure have taken place to such an extent as to convince the observer that disease has been gradually increasing for a lengthened period. The thermometer is the only true guide by which we are able to discover the end of the incubative, and the beginning of the active stage. For example, the introduction of the disease into Australia from this country proves that the first manifestation of illness is not at all to be depended upon as a guide to its true commencement; for the carriers of contagion—bulls for breeding purposes—were three months on the voyage; the disease only breaking out after they were landed.

It is of great importance that thermometric observation should be made during the prevalence of pleuro-pneumonia, in order

*Professor Yeo questions its zymotic character.

† From Principles and Practice of Veterinary Medicine.

that owners of stock might be warned in time, and that measures be taken to isolate or otherwise dispose of all animals in which the temperature is found to be rising. In a suspected herd, all animals showing a temperature above 102° should be carefully watched. If the heat rises above this, there can be little doubt that the disease is at work. Usually the temperature rises to 103° or as high as 106° ; but I have no case on record where the latter point has been exceeded.

The palpable or obvious symptoms are slight rigors or shiverings, the hair merely standing the wrong way; loss of appetite to some extent; secretion of milk diminished; in some cases the animal "knuckles over" at one hind fetlock, usually the right one; an occasional cough is heard, which is dry and hard in character, and not the painful cough of pleurisy, as one would suppose; rumination becomes irregular, and although there is some loss of appetite, the animal seems fuller than his fellows which are healthy and eating vigorously. The bowels are rather constipated, and the urine is scanty and high colored.

The pulse of cattle, as I have already stated, is not, more especially with regard to its number, a good guide to the practitioner in this or any other disease; however, as it advances, the pulse becomes accelerated and of a feeble character—sometimes a large soft pulse, sometimes a small wiry one. These insidious symptoms may continue for several days, the most careful examination of the chest denoting nothing unusual except a tenderness on pressure applied to the intercostal spaces of one or both sides, and pressure upon the back causing the animal to wince and perhaps to give a slight groan. Some cases in an infected herd will at this stage begin to give obvious signs of recovery, and in a few days be as well as ever again, the morbid material having evidently been expelled from the body without causing any important pulmonary change. In all cases, however, some amount of irritation of the lung tissue has been induced, as a cough remains for some time longer. Should recovery not take place, the signs of general disturbance gradually, sometimes rapidly, increase, the cough becomes more persistent, the mucous membranes, except that of the nose, are generally pale, the respiratory movements increased in

frequency, more abdominal and shallow. When the animal stands, the elbows are turned out, the nose extended, the back arched, and the hind limbs drawn under the body and knuckling over at the fetlocks. When recumbent the animal throws the weight of the body upon the sternum, and, owing to the anatomical conformation of this bone and its articulation with the true ribs, the chest is thus expanded.

The breathing becomes painful, and is often accompanied by a moan or grunt, emitted during each expiration; the nostrils are dilated, a discharge issues from the eyes and nose, which is at first colorless, but often becomes purulent and yellowish. The extremities, as well as the horns and ears, vary much in temperature. Sometimes all are cold; often, however, one ear and one horn may be cold whilst the others are hot, and so on with the extremities. Constipation of the bowels continue in many instances for long periods, in others it is succeeded at an early stage by diarrhoea, which, if not too persistent, seems to have a salutary effect. The surface of the body becomes harsh and dry; the skin appearing to be tightly bound to the sub-cutaneous structure; there is rapid loss of flesh; and if diarrhoea assumes a colliquative character, the animal dies in from three to six weeks from the first visible manifestation of the symptoms.

The symptoms upon percussion are tenderness and some amount of dullness; the dullness increasing in proportion to the exudation and consolidation. If, at the outset of the disease, it can be determined that both lungs are inflamed, the prognosis in all cases is unfavorable; but if, on the contrary, it can be demonstrated that but one lung is affected (the right lung according to my experience being more prone to suffer, but showing a greater tendency to recovery,) there are some hopes that the case may recover; for very frequently the morbid action is confined to the side primarily attacked.

Auscultation will detect a friction sound, caused in the first stage by the surfaces of dry pleura moving upon each other, and, in the more advanced stage, from being roughened by deposits of fibrin. These friction sounds are accompanied by others which indicate that the disease is not confined to the pleural surface only;

thus we have crepitation, both large and small, indicative of inflammation of the lung-connective tissue, with ronchus and sibilus denoting bronchial disease. It is seldom, indeed, but that some sound or other is detectable in all parts, except the lower portions of the chest; the consolidation of the lung, extensive though it may be, being insufficient to mask or hide the abnormal sounds emitted by the lung tissue, pleura or bronchial tubes.

When the disease is confined to one lung, the respiratory murmur in the healthy lung is louder than natural, owing to its having to admit more air than when both are in a state of health. This must not be confounded with a diseased condition, and in order not to make a mistake percussion must be applied. The healthy side will be resonant, the diseased one dull. I have seen some cases where the diseased and consolidated lung enlarged to such an extent as to push the ribs immediately covering it outwards to some extent, the animal appearing rounded and larger on that side in consequence, and some of these cases have afterwards thriven and become fit for the butcher.

Now and then it is found that some portion of the lung becomes gangrenous and is coughed up; these cases are, however, very rare. When gangrene occurs, the discharge from the nose becomes sanious and foetid, and a foetid diarrhoea soon carries off the suffering beast. Abscesses in the lung are an occasional consequence. An animal apparently recovers from the disease, but after a time begins to lose flesh and sinks from exhaustion, the post-mortem revealing a large abscess or abscesses in the lung tissue. Another termination is the formation of groups of tumors upon the pleural surfaces, more especially that portion of them covering the anterior aspect of the diaphragm, upon the pericardium and peritoneum. These tumors are known amongst butchers and others as "grapes," and are supposed to be due to the tubercular diathesis. There is no doubt that sometimes these deposits are essentially scrofulous, and are caused by that condition of the body independently of pleuro-pneumonia; in other cases it is beyond a question that they are merely the altered exudatis of plenro-pneumonia—altered inasmuch as they have undergone the caseous, fatty or calcareous degeneration. In some

instances of very extensive consolidation, the sounds detectable by auscultation and those emitted by percussion are very trivial. In such it is found that the alteration of structures is most extensive in the central portion of the lungs. One symptom is very diagnostic of this condition, namely: much coughing when the animal attempts to swallow; this is caused by the exudate pressing upon the œsophagus within the chest and retarding the act of deglutition.

THERMOMETRY.—The importance of this has already been touched upon. The use of the thermometer is held to be so valuable a guide in discovering the presence of contagious diseases, that the British Privy Council insists on its use in all suspected cases, and directs that so long as the temperature of an animal is elevated, such animal must be retained in quarantine. It is of the last importance, then, that, especially in connection with this disease, the subject be understood as thoroughly as possible.

“The domestic animals present a tolerably constant temperature in health, *i. e.*, this warmth is not dependent on the atmosphere in which they are. Thus, in man it is 35.5° Centigrade (99.5° Fahrenheit); in the horse, about 38.25° C. (100.85° F.), and in cattle, 38.2° C. (100.76° F.), these numbers being the average from numerous observations.

“In disease, we find more or less alteration, and Claude Bernard has proved that a disease may be fundamentally diagnosed by the mere deviations of the temperature from the normal standard.”

It has been known since the days of Hippocrates that increase of temperature was a reliable sign of disease, but it is only since the invention of the thermometer that this can be measured exactly.

“*Clinical Thermometry* is that which furnishes us with the variations of the animal temperature during disease * * * It proves of immense advantage to the practical veterinarian, under some circumstances pointing out the approach of disease * * * and provides valuable hints in the treatment.

“This instrument (thermometer) is necessary where exact-

ness is required, and it answers the same purpose in investigating the temperature as the second hand does in counting the pulse."

In using the thermometer "it is placed six or eight inches in the rectum, and in complete contact with its walls: it should be left in this situation about ten minutes, after which it should be read by partially withdrawing it; replaced again for another two minutes, and again read."*

In this way correctness is insured, and to save the time of the operator it is suggested that the thermometer be brought to near the normal temperature of the body before inserting it. The rectum should be cleared of excrement before the instrument is inserted. Zundel gives a very excellent table, whereby the temperature may be recorded conveniently, which all inspectors should use, as it enables a complete record of large herds to be kept with ease, the results being apparent at a glance.

To show the reliance placed upon the thermometer by the British authorities, the following *résumé* of the Report is presented:

"Notwithstanding Article 3 of the Circular of 1873, prescribing the obligatory slaughter of pneumonic animals, the Privy Council, attributing in great part the continuation of the prevailing pleuro-pneumonia to the delay of slaughtering * * * are of opinion that the disease would be efficaciously stopped by other disposition if executed in the following manner:—

"1st. Cattle affected with pleuro-pneumonia must be killed in the shortest possible time.

"2nd. The *internal temperature* of each animal which has been exposed to contagion must be observed, and the herd divided into two separated lots.

"The lot A will include animals whose temperature will rise above 103° F. These will be destroyed in the shortest possible time, if positive symptoms of pleuro-pneumonia became manifest.

"The lot B will include the balance of the herd. Those animals will be examined *with the thermometer every week, and transferred to lot A if the temperature rises above 103° F.*"

* Aug. Zundel.

As the result of a great number of experiments, a distinguished continental authority, Ed. Dele, comes to the following conclusions :* “The *invasion* of pleuro-pneumonia (not easy to recognize) is accompanied by an increase of temperature. This continues during the period of *increase*, and it is at its height at the period of *acme*. From that it declines and indicates the period of *decline* towards recovery (slow diminution) or towards death (probably more rapid).”

TREATMENT.—Seldom indeed will the enlightened practitioner attempt medicinal or curative treatment. One reason for this is the danger of keeping infected stock, for generally a case of apparent recovery is not a sound animal.

Dr. Thayer gives the following as a case of supposed recovery: “One-half or two-thirds of the lungs are solidified; the first effort of nature is to throw around the diseased mass a covering of fibrinous material, entirely shutting off the healthy from the diseased tissue, which is generally accomplished in from fifteen to forty days. Suppuration then commences on the surface of the diseased mass, which continues until the whole is liquified; absorption is constantly going on, and in from six to twenty months the animal recovers, but with the loss of a portion of the *vital organ*. If the animal is a working bullock, its value is destroyed; if a cow in milk, after the acute stage is passed, the secretion is partly restored, and the milk consumed by the people.”†

If treatment is undertaken in any case, no attempt must be made to “cut short” the course of the disease. Unfavorable symptoms may be controlled by medicine, and every attention given to hygienic measures. The sick must be carefully segregated, have plenty of fresh air “but without producing draughts: the skin should be protected by a light rug, which must be sufficiently thin to allow of cutaneous transpiration; feeding not to be thought of in the earlier stages;” later, semi-fluid matter, as milk, glycerine, and raw eggs may be given in the acute stages, cod liver oil and molasses in the convalescent. Brushing the skin

*Ed. Dele in AM. VETERINARY REVIEW.

† Massachusetts Report.

is useful. “Medicinally, laxatives—hydrogogue salines in preference—should always be administered in the outset * * Skin and diuretic medicines—as cream of tartar, acetate of ammonia, camphor and nitric ether, with carbonate of ammonia—should be given in the early stages; stimulants later. In the convalescent stages, iron compounds, arsenic, and hyposulphite of soda with nux vomica or strychnia alternated with dilute sulphuric acid.”*

Bleeding is not to be recommended, nor are counter-irritants successful.

PATHOLOGICAL ANATOMY.

In order to understand more clearly the post-mortem appearances seen in *pleuro-pneumonia contagiosa*, we may briefly indicate the normal anatomy of the bovine lung. The chief peculiarity, and one which involves the other peculiarities, is the distinctness with which the lobules are marked off and separated from each other. This division is accomplished “by thick layers of cellular (areolar) tissue, continuous with the internal face of the visceral pleura (those septa are rather the interlobular ramifications sent off from the *subserous envelope*.) Dietrichs, who first drew attention to this peculiarity in the larger ruminants, has justly remarked that it perfectly explains the altogether special characters of lesions of pneumonia in these animals.”†

The special points in the normal anatomy have been thus summed up:

1st. The vascular and bronchial territories are distinctly defined and independent of one another.

2nd. The lobules of the lung in the ox are quite distinct, and may be separated without injuring their air-cells, (they may be drawn $\frac{1}{8}$ of an inch apart without injury to the connective tissue connecting them.)

3rd. Each lobule is enveloped in a case of connective tissue, which contains a rich plexus of lymphatics.

4th. A sheath of delicate connective tissue also surrounds the

*Professor Walley.

†Chauveau. See also Strangeway's Anatomy.

broncho-vascular system, and forms the bed of large lymph channels.

5th. The lymph from the interlobular spaces passes along the peri-bronchial passages.

6th. As the lymph vessels follow the course of the broncho-vascular systems, those around any given system must drain the territory of the lung tissue supplied by that system.

7th. The subpleural lymphatics seem to take a less important share in draining the tissue than is the case in many other animals.

In order that we may more clearly understand the changes, we notice, first, the *Pleural*; second, the *Lung*, and third, the *Broncho-Vascular* lesions.

Changes in the Pleura.—These show pleurisy of an acute type, differing, however, in not being diffused, as in ordinary pleurisy, but localized. Wherever the lung below is the seat of disease, the pleura above is covered with a dense fibrinous exudation. As the disease advances in the substance of the lungs, the contiguous lobes become firmly cemented by the adhesion of their pleural surfaces. The visceral and parietal surfaces are generally separated by a quantity of fluid effusion, which is thin, yellowish or greenish in color, coagulating after removal, showing the presence of some fibrin. If the anterior lobes are affected, the pericardium generally becomes inflamed and thickened as well as the pleura. To sum up :

1st. It has the character common to the ordinary forms of acute pleurisy.

2nd. It always varies in degree of severity in different parts of the same pleura.

3rd. Its point of greatest intensity corresponds to the apparent starting point of the lung lesion.

4th. It is not an invariable or essential part of the disease, for the lung may show disease and the pleura not.

5th. It usually appears to be of more acute type and more recent development than the lung lesion.

6th. Its occurrence often gives the first indication of the existence of disease.

Changes in the Lungs.—The situation of the disease of the lung is generally shown by the lesions, already mentioned, of the pleura. But if this is absent, the pleura not being affected, the portion of diseased lung tissue can still be easily recognized as a hard, heavy, airless, discolored mass, standing out boldly from the neighboring normally collapsed lung tissue, which is light, soft and elastic.

The extent to which the organs may be affected varies greatly; it may be a nodule the size of a man's fist, or, in a long standing case, the whole of one lung (more often the right), or the greater part of both, may seem to be involved. By inflation, the small remaining healthy portion may be brought into view. Even in an inflated lung, however, the diseased stand out above the healthy portions, being considerably increased in size, from the hyperplasia in the interlobular spaces.

If, now, a section be made through the affected part, cutting from the surface toward the root of the lung, we find the diseased part *wedge-shape*, the point towards the root, the broad part to the pleural surface. This is not so well seen in the advanced cases, but is exceedingly characteristic in the earlier stages. The line of demarcation in these cases always corresponds to the interlobular spaces. These sharp lines of demarcation, not only between the healthy and diseased structure, but also between the several territories affected with the various degrees of morbid change (which are so different in color), are among the most obvious characters of the anatomical appearances.

Perhaps the most striking appearance seen on the cut surface is the net-work of pale yellow lines which is distributed over it. The lines forming this network are, on an average, about $\frac{1}{8}$ of an inch in diameter. They cross each other so as to map out the surface into a number of polygonal areas, about one-half or three-quarters of an inch in diameter. These areas are found to correspond to the lobules, and the lines are formed by the exudate into the interlobular connective tissue. These pale lines resemble, in a cut lung, the veins in marble, hence that name has been given. This marbling is considered (by some) to be the great diagnostic character of this disease.*

* It is but proper to state that, although Professor Yeo and others hold the opinion stated above, Professor Williams and others dissent entirely from it.

Three very distinct conditions of the lung tissues are to be noted: 1st, *clear exudation*; 2d, *opaque consolidation*; and 3d, *black consolidation*.

The two latter forms, viz.: the opaque and black consolidation, are seen in various stages in the diseased lung, generally, however, if they co-exist, being sharply divided from each other by the pale markings spoken of previously.

The portion of tissue showing the black consolidation are denser, heavier than the opaque, and show a further advanced and more intensely diseased condition. Around both the opaque and black portions, however, may be seen the first conditions spoken of, viz.: the clear exudation.

This may be spoken of as simply exudate, and infiltrates the tissues with a clear material, found, as previously stated, in the periphery of the diseased portions, forming a very complete case around them. The three conditions spoken of now may seem to shade off into each other, but they are really distinct. The clear and opaque forms, also, may be seen without the black, but the latter is never found alone, being always associated with and preceded by the other lesions, which seem to be of much longer duration.

The more important of the foregoing facts, as to the lung change, are:

1st. The lung parenchyma is usually the seat of various forms of irregularly arranged exudation, which gives it a mottled look.

2d. The interlobular spaces are always the seat of more or less exudation, which gives the sections the appearance of pale yellowish lines.

3d. These pale lines sub-divide the mottled surface into irregular small fields—*marbling*.

4th. Three kinds of lung lesion—(a) Clear exudation; (b) Opaque; (c) Black consolidation.

5th. (a) or (b) may become dense, and form tissues of cicatricial hardness.

6th. (c) may produce gangrene, caseous degeneration or fibrinous crumbling.

There remains now to speak only of the changes in the bron-

cho-vascular systems. These systems will be spoken of together, as they are so intimately connected, the bronchus lying between the artery and vein, all being surrounded by a sheath of connective tissue, in which ramify the lymphatic vessels.

On cutting across a portion of diseased lung, we find the bronchus occupied with a dense mass of granular material, which completely occludes the smaller bronchi and tapers off into the larger ones. If this is removed, we find the mucous membrane rough, discolored (dull grey or yellow), and stripped of its epithelial lining.

The walls of those air tubes which contain the firm plugs are always enormously thick and dense. And, besides this thickening of the walls of the bronchi, their delicate connective tissue sheath is the seat of dense exudation; as a consequence, becoming a tough and rigid case. This exudation appears to be, in character, similar to that which fills the interlobular spaces.

As the blood-vessels ramify with the bronchi—surrounded by the same connective tissue sheath—it is not surprising that we cannot have morbid changes in the bronchial without speedily finding them in the vascular system.

As a matter of fact, the walls of the blood-vessels soon become engorged, the external coat being first attacked, the others, in turn, becoming thickened and rigid. Red spots are seen here and there on the inner coat. It may be destroyed entirely for a considerable portion, and then a clot gradually forms which may completely fill the vessel. At once the stoppage is complete, the clot seems rapidly to grow into the larger branches, at last producing complete occlusion of the larger trunks.

The foregoing account of the Pathological Anatomy is much condensed from Professor Gerald Yeo's report on the subject.

The question of where the disease commences is one which has been considerably discussed, but which is not at present of any great practical importance. Prof. Yeo holds that it always commences in the "air passages as a chronic inflammation associated with destruction of the bronchial mucous membrane," while the contrary opinion is that it may originate anywhere, either as above or in the lung tissue or the pleura.

Professor Yeo's opinion is strongly supported by the generally admitted fact that the bronchial and peri-bronchial lesions are of older standing than those of the parenchyma, while the pleuritic are the most recent of all. He says:

"I can well understand how a beast, by sniffing the fodder of a diseased neighbor, may draw into its air passages some of the dried discharge, and thus infect the bronchial mucus membrane and get pleuro-pneumonia, while all the skill of science will not induce the disease of the lung" by inoculation with the same material.

Of more importance is the question whether pleuro-pneumonic meat is fit for human food or not. The Dublin Sanitary Association appointed a committee to examine the question, and after a full enquiry they reported decidedly against its use. On the other hand, another committee, appointed by a different society, but composed of equally distinguished medical men, and after as careful an examination, say: "It follows * * * that the *fresh* and *unchanged* meat of animals slaughtered during an attack of pleuro-pneumonia may be safely consumed, and that such meat is not sensibly less in nutritive value than that of other animals unaffected by any disease, but that it is of inferior quality."

There can be little doubt that this is the case; in the early stages it is perfectly fit for human food.

Dr. Blake White has carefully examined the milk of cows suffering from pleuro-pneumonia, and he reports it as decidedly unfit for human food. He says: "I have no hesitancy in pronouncing these samples of milk not only unwholesome, but in consequence of the very low percentage of fat, innutritious, and showing in every way what a depreciating effect unwholesome and insufficient food has upon this important secretion."*

*Report of Sanitary Inspector.

(*To be continued.*)

SOCIETY MEETINGS.

MONTREAL VETERINARY MEDICAL ASSOCIATION.

This Association held its opening meeting for the winter session of 1880-81 in the lecture-room of the Veterinary College, Union Avenue, on Thursday evening last—the President, Dr. Osler, in the chair. The President opened with an address to the members, before retiring from office. The meeting then proceeded to the election of officers for the ensuing session, with the following result:—President, C. J. Alloway, V.S.; 1st Vice President, James Bell, M.D., 2nd Vice President, M. C. Baker, V. S.; Secretary and Treasurer, E. J. Carter; Librarian, B. D. Pierce.

Mr. Alloway then took the chair, and addressed the meeting; followed by Professor McEachran, Honorary President, who expressed his satisfaction upon the prosperous condition of the Association and the library connected with it, which is now one of the most valuable on this continent, containing all the oldest and the most recent works on veterinary and collateral sciences. He also pointed out the benefits to be derived by the members of the Association from their meeting together for the purpose of hearing papers read and discussed.

The following gentlemen were proposed as members of the Association:—A. W. Clement, Geo. W. Goetz, T. J. O'Connell, Alfred W. Mears, James Brodie, J. A. Duncan, P. Paquin, F. Paquin, P. A. Pomroy, L. W. Bergeron, C. B. Robinson, Pierre Gadbois, V. T. Daubigny, V.S., R. T. Whittlesey and William Lemay.

A vote of thanks was passed to the retiring officers.

At the next meeting, on the 28th instant, Prof. McEachran will read a paper on the important subject of "Tuberculosis of cattle and its relation to public health." A communication will also be read on "Purpura Hæmorrhagica," by Mr. Chas. H. Ormond.

OBITUARY.

It is with regret that we have to report the death of Doctor E. R. Wing, of Needham, Mass., which took place from tetanus on the 17th of October. He graduated last March and delivered the first valedictory address at the commencement of the American Veterinary College. The news of his death will be mournfully received by his colleagues and friends, as well as by his alma mater.

EXCHANGES, ETC., RECEIVED

Clinica Veterinaria, Recueil de Medecin Veterinaire, Journal de Zootechnie, Archives Veterinaires, Revue fur Thierheilkunde und Thierzucht, Oesterreichische Monatschrift fur Thierheilkunde, Veterinary Journal, Veterinarian, Revue d'Hygiene, Archiv fur Wissenschaftliche und Practische Thierheilkunde, Gazette Medicale.

Medical Record, Turf, Field and Farm, National Live Stock Journal, Prairie Farmer, Ohio Farmer, Practical Farmer, Country Gentleman.

NEWSPAPERS.—Providence Morning Star, Gazette (Montreal), Providence Daily Journal.

PAMPHLETS.—La R. Scuola superiore di Medicina Veterinaria di Milano.

BOOKS.—Report of the Board of Health of the City of Nashville.

AMERICAN VETERINARY REVIEW,

DECEMBER, 1880.

ORIGINAL ARTICLES.

NEW RESEARCHES UPON PLEURO-PNEUMONIA AND ITS PREVENTIVE INOCULATION.

BY DR. WILLEMS.

SECOND PART.

After giving the concise history of the progress of inoculation * in the different countries of the globe ; after having explored the extensive domain of positive and convincing facts in favor of that practice, facts observed and collected under most variable circumstances, by savants and agriculturists, placed in the most opposite conditions, and even sometimes adverse to that practice ; after having given a short aperçu of the deductions reached by the most authorized observers, I continue this study on exudative pleuro-pneumonia by proposing some scientific and practical considerations, which I submit with confidence to the high appreciation of the Academy.

* This forms the first part of the paper, and consist in a review of the results obtained from the operation in different parts of the world.

This is the object of the second part of this paper. I hope to prove to you, gentlemen, that my experiments and doctrines of thirty years ago, relating to bovine pleuro-pneumonia and to the inoculation of that disease, after having been criticised, far from being mythical or utopian, as considered by some, offer to-day as then, and more than at that time, characters of an incontestable exactitude. They are based upon positive facts, and a rigorous observation of the phenomena which take place in the order of nature.

The principles I expressed on this subject, in my first publications, have become more evident as time and experience have progressed. I resume them in the following fundamental propositions. I will explain some extensively, placing at the disposition of the Academy the demonstration of the others, if it is its desire to open a discussion upon the important question of the preventive inoculation of bovine pleuro-pneumonia:

I. Exudative pleuro-pneumonia is a general and specific disease (*totis substantiæ*).

II. It is contagious, inoculable by miasma or volatil, and by fixed virus. It never originates spontaneously.

III. Inoculation produces a general disease, similar in the whole to that which is known as exudative pleuro-pneumonia.

IV. Exudative pleuro-pneumonia attacks, with rare exceptions, the same animal but once.

V. Properly inoculated, the animal is protected from pleuro-pneumonia; he resists the contagion.

VI. Inoculation produces no effect upon an animal cured of pleuro-pneumonia, nor upon one inoculated successfully the first time.

VII. Pleuro-pneumonia is an affection proper and exclusive to bovines; it is not transmissible to any other animal, nor to man, either by contagion or direct inoculation.

VIII. The pathological product of inoculation is as a whole, similar to the exudated matter in the lungs, or other organs of the sick animal.

IX. The inoculated disease transmits exudative pleuro-pneumonia only by re-inoculation.

X. The fresh liquid product of the exudation of the lungs of a sick animal, in the first or second degree, is the best to inoculate with.

XI. The tail of the animal is the best part to implant the virus.

XII. Inoculation produces effects more violent upon the subject, or in the herds exposed to epizootic than upon others not contaminated.

XIII. Inoculation does not act as derivatives do, such as seton, trochiscus, &c.; it is not either, a septic inoculation.

XIV. The virus of pleuro-pneumonia possesses the properties of virus in general, that is, those of contagion, incubation and regeneration.

XV. In the exudate of the lungs, in the collections of the pleura, and again in other parts of the diseased animal, as also in the products of the inoculation are found germs corpuscles—microbes which are the agent of the transmission of pleuro-pneumonia.

XVI. Exudative pleuro-pneumonia, better known to-day, must not any longer be classified in the class of virulent, but in that of parasitic diseases.

I.

CONTAGION AND SPONTANEITY.

At the time of my first researches upon exudative pleuro-pneumonia, in 1849 and 1850, those, who until then, had studied this disease, were far from agreeing as to its nature and its contagious character. Some considered it as a purely inflammatory disease of the pulmonary tissues, brought on by external causes, such as cold, giving rise to a pneumonia *a frigore*, such as a too alibile, exciting food, &c. Others, more perspicacious, saw in it a general disease,—an affection of a specific and contagious nature, and this opinion prevailed principally in Germany. These two opinions upon the nature and character of exudative pneumonia, gave rise to two parties of observers, the contagionists and the spontaneists.

To-day, opinions have changed, and almost all those who have studied this serious problem admit the contagion; only a few, and

that is the smallest number, while they admit it, believe that this affection may, in peculiar cases, originate in the concurrence of external circumstances and without the contact of a sick animal carrying the germ of the disease.

At the time of the publication of my first paper on pleuro-pneumonia, Huzard, Delafoud, and many others, had denied the contagion; Verheyen and Fallot doubted and did not admit the existence of a virus. Fallot, however, one of the most elevated and enlightened minds of this learned body, said in a report made in 1852 upon a paper that I had sent to the Academy at that time:

“All the theoretical views followed by Mr. Willems in his treatise are dominated by a question of fact, in which the commission has not to inquire. In it, all is subordinated to the existence in exudative pleuro-pneumonia, of a virus transmissible and apt to communicate a disease similar to that of which it is the product, and, to admit such a virus, it would be at least necessary to have the proof that the transmission has taken place; as long as we have not, the existence of the virus remains doubtful, and all the consequences deduced from it, all hypotheses, ingenious or not, conceived to explain now the efficacy of inoculation, and again, the reverses which followed it, fall from lack of support.”

Since that time, the solution of the question has made immense progress, and in the actual condition of disease who would dare to deny the contagion?

All those who have seriously studied that question admit it as certain, such as Chabert, Henry Bouley, Saint-Cyr, Mathieu, Sanson, Chenier, Reignault, Tabourin, Chauveau, Bollinger, Ulrich, Gerlach, Hering, Zundel, Wellenbergh, Jennes, Simonds, Gamgee, Bruce, Cox, (of Dublin) Fleming, &c., the veterinary school of Lyons, those of Germany and Netherlands, all the official commissions, Belgian, French, German, Italian, Netherlands, &c.

Here is, amongst those, the opinion of the French scientific commission, of which M. Magendie was president and M. Henry Bouley, reporter:

“Epizootic peripneumonia of horned cattle is capable of transmitting itself by cohabitation from diseased to healthy animals of the same species.”

But, in admitting that pleuro-pneumonia is contagious, could it not originate spontaneously from internal causes, or has it always necessarily as an originating cause the impregnation of the organism by a virus from the outside ?

This last opinion is the most accredited and the best founded.

“Can contagious peripneumonia,” said M. Henry Bouley, “originate spontaneously ?”

“No,” says he, “for it is *contagious*,”—M. Tabourin answers us. “As long as the question of its contagiousity remained doubtful, its spontaneous developement might be admitted as probable ; but since the researches of Dr Willems upon the contagion and the virulency of this species of peripneumonia, M. Tabourin cannot comprehend that its spontaneity could still count partisans. Starting from the absolute principle that contagion is identical with generation, he is necessarily brought to deny the possibility of the spontaneous development of a disease whose contagious properties are known. This manner of conclusion is consequent with the doctrine, but is it concordant with facts ?”

In 1874, Mr. Bouley seemed to be still in doubt, but I believe that at present his conviction is in favor of the solution of that question.

My personal experience, after a close observation during long years, of the march of pleuro-pneumonia, has convinced me that this affection is exclusively contagious, transmissible from sick to healthy animals by inoculation and by infection, that is to say artificially by fixed and naturally by volatile virus. It never originated spontaneously.

Mr. Pasteur does not admit the spontaneity for transmissible diseases, and certainly he is right for what concerns the etiology of several contagious diseases, whose parasitic nature is already known. This principle is also applicable to peripneumonia, whose special factor is a parasite, a living being.

Gentlemen, I will try to demonstrate to you that facts based, I repeat, upon rigorous observation and experimentation, justify this opinion. The solution of the question of the spontaneity of pleuro-pneumonia is, nevertheless, of great importance in practice, as upon it depends the adminis-

trative measures, sanitary and prophylactic, to be taken for the protection of cattle and consequently for the good alimentation of human species.

By insisting at length upon the question of spontaneity and of contagion of exudative peripneumonia, I have for my object to demonstrate that the facts of practice agree with the doctrine upon the nature and pathogeny of this affection, which, for me, proceeds from a parasite, and consequently never arises spontaneously, the spontaneous generation of this parasite being impossible, according to the recent researches of Mr. Pasteur, Tyndall and others.

A. In the town of Hasselt, and in all the province of Limbourg, I have never seen and never heard that pleuro-pneumonia had originated spontaneously. On the contrary, everybody knows the exact date of its first invasion and it has been easy to follow its march through the province, from one point to another. The first diseased animal was introduced in 1836, from Flanders, in the town of Hasselt, where never before that time, any case of pleuro-pneumonia had been seen; and from that time it spread with frightful rapidity in the city and surroundings. Since, it has not disappeared from the stables of distilleries; it has been kept up by contagion, following the introduction of contaminated animals, coming from foreign markets, especially those of Holland and Germany, because the distillers of the town of Hasselt receive a great number of horned cattle often renewed.

The disease having once taking lodging in a stable, it is only extirpated with difficulty; notwithstanding the use of the most powerful disinfectants, contagion exists; it attaches itself to the ground, the beams, straw, walls, &c., and a long time after the stable has been emptied and white-washed, even for years, the miasma dried and preserved, reproduces itself by the introduction of fresh animals, under the influence of the warm and damp air, becomes loose and falls upon them to infect them. Here is an example, taken amongst many others of my acquaintance.

In the village of Curange, near Hasselt, there is a farm where, about three years ago, four cattle were affected with pleuro-pneumonia and were killed. The barn remained empty from 1877

till 1880. A new farmer came and placed in that barn four cows, coming from a farm where they were raised, and where there never was a case of pleuro-pneumonia. These animals had not been in contact with any other diseased beast and nevertheless two amongst them became pneumonic. Is this a case of spontaneous pleuro-pneumonia! No, it is more than probable that the miasma of the disease was preserved in that barn since the existence of the epizootic which prevailed there. What we observe, concerning the long duration of the conservation of the miasma of pleuro-pneumonia, was observed also for several contagious diseases of man.

Mr. Hairion, the learned Professor of the University of Louvain, our honorable colleague, cites analogous cases relating to granular palpebral ophthalmia, an affection which he has perfectly studied and upon which he has thrown so much light. He relates in his *Memoir upon that disease in the army*, published in 1848, facts observed in the barracks of the Dames-Blanches at Louvain, and in the young ladies' school at Thildonck, where the contagious principle was propagated by the medium of contaminated objects and was preserved in the said barracks of the Dames-Blanches for a long time, when, under the influence of favorable circumstances, it returned in the air, thus forming new centers of infection, susceptible of reproducing the disease amongst those living in it.

Mr. Hairion reports that soldiers arriving perfectly healthy in the barracks, and being carefully examined, contracted palpebral ophthalmia in the undisinfected and empty rooms, where in one case eighteen months, and in another three years before, diseased men had lodged.

And again, the experiments made by Mr. Pasteur, relating to the theory of spontaneous generation, have proved that all over in the air are suspended the germs of lower organisms and more particularly in hospitals, rooms with large gatherings of people, stables, &c., &c.

In 1861 Dr. Eisel, of Prague, placed between two beds, in a ward occupied by thirty-three children affected with purulent ophthalmia, an instrument analogous to the areoscope of Pouchet;

amongst the corpuscles of the air gathered against the plate of glass, moist with glycerine, were found globules of pus perfectly evident.

To this fact is added that of Mr. Nepveu, chief of the laboratory of the Pitié, recently presented to the Society of Biology :

A square meter of the wall of a surgical ward, which had not been washed for two years, was cleaned, and the liquid squeezed out of the sponge used for that purpose, examined immediately afterwards. It was blackish in its whole mass, and contained micrococci in large quantity, some microbacteria, and besides epithelial cells in small number, some globules of pus, red globules, and finally irregular blackish masses and ovoid bodies of unknown nature. The experiment was carried with all precaution to avoid causes of error ; the sponge used was new, and thoroughly washed in recently distilled water.

In the stables infected by exudative pleuro-pneumonia, the air condensed upon a vase containing cold water, and collected on a clean plate, has given me the proof that this liquid contains the peculiar corpuscles that one finds in the lungs of animals affected with pleuro-pneumonia.

A plate of glass moist with glycerine, hung during several hours in a stable containing diseased animals, and examined with the microscope reveals also the presence of the peculiar corpuscles, which I will describe further on.

That which, experimentally, made me believe also that the expired air of the lungs of a sick animal, as well as the saliva, contains the germ of the disease, is the fact that diseased animals to be given up for consumption, starting from Hasselt, before the establishment of railways, followed especially three roads—one towards the abattoir of Liege, one towards those of Brussels and Anvers, the third towards Beverloo.

And, after some time, all the inns on the road where those animals had stopped, and even the farms situated on those roads became infected.

Here amongst others is a fact corroborating the preceding ones :

A small herd, composed of four or five diseased animals, was slowly going towards Beverloo by an out-of-the-way road, when

towards evening those animals, worn out by fatigue, were clandestinely introduced in a field situated near the farm of Terlamen, where they passed the entire night, and soiled the grass with their infected saliva. The next day the herd of the farmer was placed in the same pasture, and shortly after, almost all the animals of the farmer were affected with the epizooty.

I have said that the diseased animals which often pass the road to the camps are to serve as food for our soldiers, who ordinarily eat poor meat, and that because the war administration tries, before all, to buy meat at low rates. It costs from seventy to eighty centimes a kilo. This meat of diseased beasts is neither succulent nor very pleasant to eat, but, I must declare, is not injurious to public health. Pleuro-pneumonia not being contagious to man, there is no danger in consuming the meat of diseased animals, so long as the alteration caused by the disease has not arrived at its last period; and you all, gentlemen, especially those who live in large cities, have eaten more than once the meat of pneumonic animals.

At the time of my first experiment upon pleuro-pneumonia, when that disease existed with such intensity that a large number of animals were destroyed and consumed in the city; when the knacker himself, by an unaccountable toleration, sold ostensibly and at low price the meat of animals often pneumonic in the third degree, I have collected the statistics of the mortality of the population of Hasselt during five years (1850-1855), and I have found that during those years, where a great portion of the population were eating meat from diseased animals, well-to-do families especially, there were comparatively less deaths than during previous years. I explain this difference in the mortality by the reason that meat is necessary to keep up the health of man, and that it is better to eat meat of pneumonic animals than not at all.

Mr. Loiset, veterinary surgeon at Lille, is of the same opinion. He has shown that during a period of nineteen years, 10,000 peripneumonic cows have been consumed, without having observed a single accident, without the slightest disturbance in the sanitary condition of the people.

(To be continued.)

EXPERIMENTAL ANALYSIS

OF THE MALIGNANT PUSTULE AND CARBUNCULOUS ŒDEMA; DETERMINATION OF THEIR VARIOUS FORMS AND OF THEIR DEGREES OF VIRULENCY. (*)

By M. COLIN, of Alfort.

Continued from page 264.

II.

I arrive at the second point of my communication, the most interesting. It covers several questions, first, the following :

1st. Is the carbunculous pustule of the dog or that of other animals which have died from it, virulent ?

2d. If it is, is it so at all its periods or at some determined time ?

3d. If it is, how does its virulency stop spontaneously, without giving rise to the general accidents which kill man and herbivorous animals ?

Let us answer these questions :

In the first place, one might believe, *a priori*, that the carbunculous pustule, by the fact that it does not bring on general accidents on carnivora, is an incomplete pustule ; pathologically considered a sterile and non-virulent pustule ? It is not so, however. It is complete ; it is as fertile as in the species where it has fatal terminations.

But, to insure its virulency, one must proceed with method, not attack it too early and avoid to take up that which has been inserted in the puncture by the lancet or the needle. The liquid introduced in it preserving its properties for a certain time, would induce a belief in an artificial virulency. In 1873 I demonstrated that the septicemic virus, without action upon horse or donkey, is found intact after several days in the small puncture

* From Archives Veterinaires.

where it has been deposited, so much so, that carried upon a rabbit, it kills him with its ordinary rapidity. After twenty-four hours, when the carbunculous pustule is well defined, the serous liquid which escapes spontaneously from the puncture, or which is squeezed by pressure, is apt to give anthrax to the rabbit, guinea pig, and to all the animals liable to contract it. That which is obtained the second, third or fourth day, still possesses its activity. Here are the proofs.

The serosity of a carbunculous œdema of the dog in the twentieth hour killed a rabbit in four days.

That of a malignant pustule in an animal of the same species proved virulent at the twenty-fourth hour. That of the œdema of another, virulent at the forty-eighth hour.

That of a carbunculous tumor was virulent at the forty-eighth hour and killed at the seventieth.

That of a malignant pustule of forty-eight hours killed a rat.

The serosity of a tumor of seventy-two hours has also proved virulent.

That taken from the interior of a malignant pustule, which had proved fatal after six days, had yet a weak virulency.

On the contrary, that property was often absent in the same liquids, though they contained bacterides, even at an epoch very near the first moments of the evolution of the tumors, pustules or œdema.

For instance, the serosity of the œdema of a cat became sterile at the forty-second hour.

That of a pustule of fifty hours produced no effect.

The bloody serosity obtained on the dog by scarifications on a tumor of one hundred and twenty hours, produced no accident.

The serosity oozing from a malignant pustule of a dog at the seventy-third hour, was sterile.

The serosity of the phlyctence of the same pustule at the seventy-fourth hour, sterile. In those three liquids there were some bacterides and many shying granules, having the character of the corpuscle germs of bacterides.

Finally, the serosity of a carbunculous œdema of the horse, and the reddish liquid of a carbunculous tumor of the same

animal, both at the eighth day, have shown no virulent property.

Outside the opening, on a radius of one, two and three centimetres, the serous liquids, the blood of the tumor obtained by small scarifications equally possessed virulent properties during several days, and, remarkable fact, the virulency extends around the opening as it diminishes in its interior, either by diffusion of the virulent elements, or by their progressive neutralization in the plastic or purulent products as in the parts of tissue that gangrene invades. The virulency which has spread from the centre to the circumference of the tumor dies out in the same order; it may disappear completely in the centre, when at the periphery it retains all its activity.

However, at a given time all the liquids of the tumor or of the carbunculous pustule are not equally virulent. Two amongst them, the serosity of the phlyctence and the pus from the cavity of the opening or of the viritiated cellular tissue, are seldom such and never strongly so. The cloudy serosity, somewhat loaded with leucocytes, ordinarily is; very clear pus is only in half of the cases; but thick pus, that which loosens the eschar or carries off gangrenous parts, has already lost this property.

Beyond a certain period, whether there is or not suppuration, whether the opening of the pustule is closed or enlarged by the work of gangrene, or of ulceration, whether there remains or not marks of irritation, all virulency disappears and the inoculation of the serosity, of the blood, of the solid particles sloughed off from the pustule, all remain entirely sterile.

There are, then, in the carbunculous tumor or in the pustule which gets well of itself, as in that which kills, virulent elements, associated in variable proportion to the serosity, to the blood, to the lymph, to the tissues, even to the pus in way of formation; but these elements are there only temporarily, they change places before disappearing, rarify in certain parts, condense together in others, whither they are to die in situ or spread in the whole of the organism.

These peculiarities which I observe upon animals, especially upon the dog, explain very well the opposite results given by inoculation of the products of the malignant pustule of man. The facts mentioned by Mr. Rainibert, prove indeed that the insertion

of the serosity of the vesicles, round the eschar, is almost always sterile, while that of the tissues of the pustule give often, but not always, anthrax. One must not hope for concordant results in operating upon liquids whose properties are not uniform in all the points of the tumor, and vary according to the periods of the diseased process.

Now that the virulency of the carbunculous pustule is well established, it remains for us to inquire why upon certain animals, this virulency dies out spontaneously, and why, in others, it gives rise to fatal general accidents.

Let us take two dogs with carbunculous pustules, developed at the same time, in the same place, for instance the axilla or the mammæ, and let us follow them comparatively : the first, second, third day, the tumors in both animals may resemble each other exactly ; they will give clear serosity, virulent, more or less loaded with bacteridies ; there will be little fever and anorexia, but no digestive troubles, no prostration. From the end of the third, fourth, or the fifth day on one of the patients, the tumor may lose its red color, sink down, ulcerate on its summit, or will suppurate and then the fever will abate, the appetite return, and the animal recover without treatment. But on the other, on the contrary, the tumor, instead of passing towards resolution, remains, becomes marbled, purplish, the fever continues, the weakness increases, the pulse weakens, and finally coldness and death, as in the case of generalized carbunculous affection.

These differences in progress of the pustule do not seem to be deduced from the aspect or size of the tumor, nor from the violence of the local irritation, nor the intensity of the fever. One must look for the reason of it in the concealed characters of the morbid process.

Let us then take two other dogs in the same condition, and after watching them, let us kill them the fourth, fifth or sixth day. Here is what we will find :

Upon the one whose tumor is in way of resolution, the liquid of the puncture has disappeared ; if a small quantity remains, it contains only leucocytes, fine granules, no bacteridies ; the blood vessels are free, there is but little extravasation of blood, almost

no œdema; the ganglions nearest to the tumor are scarcely tumefied, without change of color. Their pulpe inoculated to the rabbit does not produce anthrax, the spleen is not hypertrophied, the heart has no ecchymosis, the intestinal mucous membrane is not at all congested. Upon that animal, anthrax has remained a simple local accident; the virulency has died in its start, the bacteridie has disappeared from the cavity where it was introduced, from the œdema where it has spread and from all parts where it has died, without leaving marks of its presence.

Upon our second dog, it will not be the same if the pustule has been followed by general accidents. The tumor has preserved its size, the skin is of a dark color, perhaps cyanotic; its blood vessels are gorged with viscous blood, all its tissues are infiltrated with bloody liquid; there is œdema spreading round. Every thing is virulent in the tumor; the bacteridie is in good abundance; here long and flexuous, there in short separated segments, some transparent, others with shying points on their tract or at their extremities. Besides, anthrax has spread beyond the limits of its starting point; not only the prepubic, mammary and inguinal ganglions are tumefied, blackish, often reduced to pulp; but the pelvic, the sub-lumbar and all those which are on the way of the virulent elements, present similar alterations; their pulp is full of bacteridies longer than those of the blood. If the disease is at its end, the spleen is hypertrophied, loaded with bacteridies like the lymphatic glands; the small intestines begin to be congested, ecchymoses are found in the left cavities of the heart, &c., &c. *(To be continued.)*

INOCULATION FOR THE LUNG PLAGUE OF CAT- TLE.—ITS DRAWBACKS.*

In our former article on this subject attention was drawn to the fact that inoculation leads only to a mitigation of the losses in this disease, but that in no country has it succeeded in annihilat-

* From the *National Live Stock Journal*.

ing the contagion. In the one city (Edinburgh) in which the result of annihilating the disease has been claimed, it was shown that there existed special conditions, which eminently adapted the city to benefit by this measure without danger of spreading the disease, and that, without at all detracting from the value of inoculation in that particular instance, it was only just to note that it was there supplemented by the slaughter of the sick and disinfection of the premises, which, in the absence of inoculation, had virtually stamped out the disease from New York City in an equally short period of time. In the present paper will be set forth some of the dangers that would attend a general resort to inoculation over a whole country.

The same contagious material is propagated in the inoculated disease as in the disease contracted in the natural manner.—To read the writings of most advocates of inoculation, one might be led to suppose that they were operating with a poison entirely different from that of the lung plague. A well-known author says:

“An objection to inoculate which weighs in the case of human and ovine small-pox, as well as rinderpest, is, that the inoculated disease is contagious; that the cohabitation of healthy with inoculated animals may lead to extensions of the infection, and that the foci whence the disease spreads are always on the increase. Such objections cannot weigh against the inoculation for the lung plague, as the inoculated malady is not communicated, except by re-inoculation. My observations on this point are very numerous, and I do not know of a single instance recorded in which contagion from inoculated animals has been witnessed.”

Such confident assertions would cast grave doubts on the value of the operation as a preservative from the plague. The liquids inoculated are the virulent products of the diseased lung; and as these do not produce disease of the lungs of the inoculated animal, but only of the tissues where they have been inserted, it cannot be supposed that they exert any influence on the economy through any direct action on the lungs. If protective at all, it must be by reason of the propagation and increase of the disease germs of the lung plague in the blood, or in the seat of inoculation. If in the blood, there must be danger of their being given

off by the various free surfaces of the body, and, above all, by the lungs. If in the seat of inoculation only (the tail), they would still escape from the raw surface, as the infection is spread from the pustules of small-pox, with the scurfy products of the skin in scarlet fever, or with the liquid products of the open sores in farcy. It is true that the amount of the virus scattered from the tail of the inoculated animal is incomparably less than that exhaled with every breath by an animal which has contracted the disease in the lungs; and this difference has led to the fallacy that contagion cannot be spread from the inoculated. Yet it must be plain to all that the inoculators are here placed on the horns of a dilemma—either the diseased germs inoculated in the tail do not reproduce themselves there, and cannot, therefore, protect the subject against the disease, or they do grow and increase in the seat of inoculation, protect the system of the inoculated animal against the assaults of the disease, and expose all inoculated and susceptible animals in the vicinity to contract the disease in its fatal form in the lungs, by reason of the virulent matter given off by the surface of the inoculation sore.

But we are not left to mere inference in deciding this most important question. Even the strong advocates of inoculation now testify to the occasional communication of the disease by the inoculated animal. In the quotation above made, it is admitted that the disease can be conveyed from the inoculation sore by reinoculation on a sound animal. But as the virus can be carried in the air, as evinced by its conveyance from the lungs of one animal to those of another, in the ordinary mode of infection, the same must be accepted as true of the same virus when developed in the tail; and the writer, who denies contagion from the inoculated wound, and yet claims that successful inoculation can be made from it, condemns himself, and is put hopelessly out of court.

Much more consistent are the statements of Mr. Watson, and they should carry the greater force in that he had a more extensive experience with inoculation in Australia and New Zealand, having had, in the latter colony, the superintendence of a station with 10,000 head of cattle:

“Inoculated cattle convey the contagion to those which are not

inoculated.—This has been proved by the disease breaking out among cattle where it had not previously shown itself, after their coming in contact with some inoculated animals which were free from the disease when inoculated. Cases of this sort, and even of cattle being inoculated before the disease had broken out among them, are so few that decisive evidence in this way is far from plentiful, but it is sufficient to establish the general fact. Further, it has frequently been the case, where all the others were inoculated, that a few head have been missed, and the percentage of deaths among those which were not operated on was always excessive; thereby showing that the inoculation of the disease on every side of them not only rendered their escape from the contagion impossible, but seemed to increase the virulency of the disease.”

The writer can fully endorse this statement from his experience in New York. In certain stables it was the practice to inoculate every animal as soon as received. In some such stables no disease of the lungs would appear so long as the system was fully carried out; but sometimes a bull or a calf would be left without inoculation, and such almost invariably fell a victim to the malady.

In New Jersey, prior to the enforcement of the State measures for the suppression of the disease, inoculation was loudly praised, and was frequently adopted even in herds that had shown no disease. The State veterinary inspectors reported various cases in which, after the inoculation of a healthy herd, the disease of the lungs had appeared in the herd in question.

Reynal (a strong advocate of inoculation), in his “*Police sanitaire des Animaux domestiques*,” p. 458, says, *apropos* of the question of the specific, virulent character of the inflammation in the inoculation wound :

“A fact which we have ourselves observed removes all doubts in this respect. A Brittany heifer, inoculated by us, communicated the peripneumonia to two others that were placed at her sides in one of the stables in the school at Alfort. The lesions characteristic of the malady were clearly shown at the autopsy in the lungs of these two heifers.”

Reason and experience agree in showing that the virus of lung plague may be communicated from inoculated to uninoculated cattle, and may be laid up and preserved in the stables where inoculation has been practiced, to infect uninoculated cattle that may be brought into such stables at a later date.

Can the stables infected by the inoculation of all the cattle of a State be perfectly disinfected?—Knowing what we do of the city cow stables and country barns that would be infected by a general adoption of inoculation, he would be a bold man who would assert that it would be possible to thoroughly disinfect all of those. The removal and disinfection of hay, straw and other fodder, the destruction of all rotten wood, the removal of wooden floors, and of the saturated earth beneath them, the re-inoculation of all subjects that fail to *take* at the first attempt, the rigid quarantine of all herds until the effects of the inoculation have passed off, the inoculation of all calves or other fresh cattle introduced into such herds, the maintenance of sick animals and infected places for the obtaining of fresh virus for constant use,—would render the measure far more expensive, unwieldy, and uncertain than at first sight appears. In the method of extinguishing the disease by the sacrifice of the sick, disinfection is demanded in such places only as the sick have occupied, or where their products have been carried. Even in such circumstances, and with a very limited number of infected places, disinfection is often found to prove a difficult problem. But with a general inoculation, every bovine animal becomes an infected animal, and every building or place where such an animal is kept, becomes an infected place. To take but a single city, like that of New York, with its thousands of herds, kept in all sorts of out-of-the-way places, many of them unknown and unregistered by the city authorities, with many of the owners unfavorable to the practice, and inclined to throw obstacles in the way, it would be an exceedingly difficult process; but when extended to country districts, where cattle are often turned out in woods and swamps, where it is exceedingly difficult to find them, it is inevitable that numbers would be overlooked and missed, to be infected later by the inoculated cattle in the same or adjoining enclosures, and to keep up the poison for the new comers in the shape of calves and fresh purchases.

As an illustration of how inoculation works, even with those who adopt it by choice, and are anxiously desirous to have it succeed, a case now transpiring at East Williston, Queens Co., N. Y., may be here quoted. In May last, after the reprehensible action of the New York Legislature had compelled the suspension of all effective sanitary work, and invited a renewed spread of the plague over districts that had been cleared, a cow was taken from the west end of Long Island into the herd of Mr. Richard H. Robbins, East Williston. She sickened, and was killed September 9th. Seven or eight other cows having suffered, inoculation was resorted to; but the inoculated cattle were kept in a field, separated by a fence only from several other herds, the property of neighboring farmers. Time will tell what the results will be. Those who have had anything to do with the quarantining of cattle on the *parole* of their owner, know how often slips are made and contact is allowed between the stock that are nominally secluded and those of others. The danger thus arising in a limited number of cases, under the process of stamping out by the sacrifice of the sick, would be increased a hundred fold by inoculation, though this were confined to infected localities only.

But the increase of such risks implies a corresponding increase of infected places and of the demand for disinfection; and as a certain number of outbreaks are always secreted, it would be practically impossible to carry the disinfectants along every channel of the stream of contagion.

Inoculation for Lung Plague not the Counterpart of Vaccination for Small-Pox.—When people are informed that a mild and non-fatal disease can be produced by inoculation for lung plague, they naturally conclude that they have here the exact counterpart of the vaccination practiced on man, and they give a favorable verdict without further consideration. But this is altogether fallacious. In vaccination the virus used and reproduced on the human skin is not that of small-pox, but of the mild and harmless cow-pox; and no matter how many non-vaccinated persons may come in contact with the subject of the operation, none can be thereby exposed to contract small-pox. *Cow-pox* may be contracted in this way, but *small-pox*, never.

A close parallel to the inoculation of the virus of lung-plague is, however, to be found in the inoculation with small-pox matter, which was practiced before the discovery of the protective action of vaccination, or cow-pox inoculation, as also in the inoculation with the matter of sheep-pox, still practiced as a protective measure on the continent of Europe. Inoculation with small-pox matter produces the genuine small-pox, and inoculation with sheep-pox virus produces the sheep-pox unchanged. The disease in each case is milder, if judiciously managed, than the affection caught in the usual way, and the losses are reduced to a minimum; but unprotected men and sheep coming in contact respectively with the inoculated men or sheep, or with their dwellings or products, contract the genuine small-pox or sheep-pox, as the case may be, and too often with all its native severity. So with inoculation of the lung-plague virus, the disease is determined in an unimportant organ—the tail—and is rarely fatal to the animal; but the disease germ is not altered, and if taken in by a susceptible animal through the air, will determine the fatal affection of the lungs. Inoculation with small-pox matter has been long discarded; inoculation with sheep-pox matter is attended with the greatest danger, and was most profitably substituted by the sacrifice of the sick, and by disinfection, in the more recent outbreaks in England; and so ought inoculation for lung plague be prohibited, except in certain safely secluded situations, in all countries where it is possible to eradicate the plague by other and more certain means.

Comparative Expense of the Mitigation of Lung Plague by Inoculation, and of its Extinction by the Sacrifice of the Sick and Infected.—This has been already hinted at in these articles, but deserves to be yet more particularly noticed. Mr. Watson says that with proper appliances five or six men can inoculate 500 to 600 cattle per day. He quotes the pay of one operator at \$50 per day; but not to be extravagant, we will suppose that this should remunerate the five or six men requisite. This would make the operation cost 10 cents per head, which cannot be considered excessive. This, for the 30,000,000 head of cattle in the United States, would cost \$3,000,000. But this does not provide

for the sacrifice of sick cattle to furnish the virus to be inoculated, for the disinfection of buildings, etc., where the inoculated cattle have been kept, for the re-inoculation of those that fail to take, for the inoculation of new-born calves, for the erection of pens in which to inoculate large and wild herds, and for numerous other attendant expenses. These cannot be set down at less than \$3,000, 000 more. But Mr. Watson's estimate is made for large herds of 1,000 to 10,000, and must be greatly increased for our small herds of 5 to 50 in the Eastern States. \$6,000,000 would therefore be far under the mark for a single general inoculation of our American cattle. But as we have already seen, no past experience with inoculation in any part of the world holds out the hope that this would rid the country of the contagion. The practice would therefore have to be kept up with each succeeding generation of cattle if they were to be rendered proof against the contagion, and thus a permanent tax of a grievous and altogether unnecessary kind would be imposed on the country.

This will be met by the statement that it will not be necessary to inoculate *all* the stock of the country, and that if we restrict our estimate to the cattle of the infected districts it will not be so excessive. This is conceded; but it must be conceded also by the party on the opposite side, that with the maintenance of the practice of inoculation there would be a permanent preservation of the contagion, that at the margins of the inoculated districts there would be the ever-present opportunity for a wider extension of the disease, and that under this method, as at present, there would be the constant danger of a sudden conveyance of the disease to the great West in the body of an infected animal, and of the pollution of the source of the cattle traffic, so that we must never forget the probability that we may soon have to adopt just such a general inoculation, not to stamp out the contagion, but merely to lessen the losses from its ravages.

In addition to all this, there is the undeniable fact that the existence of the disease on our soil persistently imposes a most oppressive tax on our exports to England, as is clearly shown in another article in the current number of the *Journal*, where this aspect of the question is fully presented.

Now there can hardly be a doubt that in the present status of the lung plague in America it can be definitely and permanently eradicated from the continent at a cost of \$2,000,000, judiciously applied. The question then, as regards inoculation and all other means of temporizing with this disease, is just this: Shall we preserve this plague at a yearly cost of from \$2,000,000 to \$5,000,000, or shall we once for all spend \$2,000,000 on its extermination, and free the country forever from the scourge?

EXTRACTS FROM FOREIGN JOURNALS.

INTRA ABDOMINAL HEMATOMA INTERMITTENT COLICS—DEATH.

BY M. PIOT.

A small percheron mare, 7 years old, is taken sick the day after she is bought. She has some slight colic and soon is in great pain. The coat is staring, the head hangs down, eyes partly closed. Pulse, 72, soft, mucous membranes subicteric; respiration short, trembling and accelerated, 38 per minute; temperature, 40°4. Heart and lungs show no signs of disease. Anorexia complete, great thirst. The abdominal cavity, whose walls are somewhat retracted, show nothing particular. The uterus is empty, the ovaries and kidneys have their normal size. Nothing is discovered by rectal examination. Slight diarrhoea. Urine healthy.

A diagnosis of acute enteritis is made and the animal is placed under treatment accordingly. No great change or amelioration is observed, and the animal dies in great emaciation after about two weeks of treatment.

At the autopsy an enormous tumor, quite spherical, entirely surrounded by the mesentery, and measuring from 20 to 25 centimeters in diameter, is found adherent in front, to the right lobe of the liver near its superior border and its posterior face; the posterior vena cava runs alongside of it in a kind of groove situa-

ted towards the superior face of the tumor. At its inferior face and a little to the left it is intimately adherent to the small colon, and by its superior part it adheres also to the duodenum. Forward and to the right it is partly covered by the pancreas; behind it is attached to the right kidney and partly surrounds the great mesenteric artery. It weighs 7 kilog, 650 gr., (over 15 pounds) and is constituted by clots of blood in different degrees of organization.—*Archives Veterinaires*.

DOUBLE PARTURITION IN A MARE—BIRTH OF A COLT AND A DONKEY.

BY M. BLANCHARD.

A mare 10 years old, after a rather difficult labor, gave birth to a horse colt. Some time afterwards she was observed having labor pains again, with violent efforts of expulsion, and the front legs of another fœtus were soon protruding through the vulva. She was delivered then by her owner of a second subject, which proved to be a little donkey, which died shortly afterwards.

The explanation of this singular fact is given as follows: In that part of the country it is generally believed that two services by the males are most efficacious to have the mare in foal. As it is not always easy to have a stallion to do this service, a jackass is often used for the second covering, and this is just what took place in this instance, the mare having thus been fecundated by those two animals of different species.—*Journal de Zootechnie*.

♀ FEMALE STRONGYLUS-GIGAS FOUND IN A MAMMARY TUMOR, NEAR THE UMBILICUS IN A BITCH.

BY M. MEGNIN.

This bitch had a litter of pups, and, though her milk was abundant, she soon refused to let them suck. Having much milk, the man who had charge of her was obliged to milk her.

Following this condition a lump had shown itself under one of the mammaræ near the umbilicus, of the size of a goose egg, interfering with the motions of the dog, especially when hunting.

The skin being cut through, the tumor was exposed, divided by an incision with a razor and the worm made its exit. The skin being sewed up, the animal recovered.

Mr. Megnin says that this is the first time where this worm has been found in the sub-cutaneous abdominal tumors. The *strongylus gigas* has been found in man, though in very few instances; it is found, rare also, in some domestic animals, the horse, the ox, and especially the dog; it has also been met, perhaps oftener, amongst wild carnivora, the wolf and the bison.

The kidneys, the bladder, the urethra and the surroundings of these organs are the tissues where it is most generally seen.—*Gazette Medicale*.

EXPERIMENTAL STUDY

OF THE ACTIONS PRODUCED UPON INFECTION AGENT BY THE ORGANISM OF SHEEP MORE OR LESS REFRACTORY TO ANTHRAX; WHAT BECOMES OF THE SPECIFIC MICROBES, DIRECTLY INTRODUCED INTO THE CIRCULATION BY LARGE TRANSFUSIONS OF CARBUNCULOUS BLOOD.

BY A. CHAUVEAU.

To resume, says the author, this is what happens to the carbuncular bacteridies, introduced by transfusion of the blood in the organism of subjects refractory to anthrax, when the resistance of this organism is great and strengthened again by good preventive inoculations:

1st. Bacteridies introduced in the circulatory apparatus soon disappear; a few hours after the transfusions none can be found. After death they are also missing. Yet, in some cases of rapid death, the clots of the heart may contain a few capable of infectious activity.

2d. If bacteridies disappear from the blood, it is not because they are destroyed; they are first stopped in the capillary network of the lungs, then in that of some other parenchymatous or-

gans, where they are carried by the circulation. They are very easily found in the lungs and spleen, when death follows rapidly in transfusions of carbunculous blood; like those of the clots of the heart, they yet possess their vitality and may be inoculated with success.

3d. When the animal survives more than three days after the transfusion, bacteridies disappear from the lungs and spleen, as they have from the blood, and the subject recovers.

4th. Then, not only there is no proliferation of bacteridies in those parts of election, splenic, pulp and blood, but the bacteridies introduced by the thousand millions in those are soon destroyed after passing probably through a series of periods of infectious activity, gradually decreasing.

5th. The inaptitude of the organism to the continuation of life of bacteridies, is not however complete: one region at least makes exception, this is the surface of the encephalon. Bacteridies carried and gathered in the meshes of the pia-mater may survive there and grow and produce a mortal inflammation. But the growth takes place with peculiar characters; elongations and inflexions of the clusters, apparition of spores; characters which look somewhat like the proliferations of bacteridies in artificial cultures or *after death*, under certain conditions of heat and of medium, in the organs and the blood of subjects which succumb to the true *sang de rate*. Those characters are never seen *during life* on those last animals; the multiplication takes place by scission in short clusters.

6th. The infectious activity of these bacteridies of the pia-mater is very great and contrasts with the sterility of the blood of the other parts of the body. Nevertheless, from what has been said previously, one cannot consider as absolutely perfect, this peculiar local activity preserved in an organism enjoying a general immunity.

A CASE OF THE LONGEST INCUBATION OF HYDROPHOBIA IN MAN.

MR. LEON COLIN reported to the Academie de Medicine, of Paris, a case of human hydrophobia with an unusually long incu-

bative stage. It was that of a soldier who had been bitten in Algeria, the 2d of November, 1874, and died four and a half years afterwards. From a minute inquiry Mr. Colin arrived at the following conclusions: 1st. It was certainly a mad dog which had bitten that soldier in Algeria, as the individual he tried to assist had died of hydrophobia forty days after. 2d. Since that inoculation in November, 1874, he had felt no effect from it, and had not been exposed to any other accident. 3d. The previous history of the patient, the symptoms observed, the lesions found, exclude all presumption of alcoholism.—*Gazette Medicale*.

BORIC ACID IN GREASE.

An ointment of boric acid, prepared according to the prescription of Neumann, is said to be most beneficial in that disease of the lower parts of the extremities. These are washed off with tepid water, or better, with a weak solution of the acid, and then the ointment laid over the diseased parts.—*Report fur Thierheilkunde*.

PREVENTIVE INOCULATION OF PLEURO-PNEUMONIA.

In the excellent chronicle of the *Recueil de Medecine Veterinaire* of last month, Mr. H. Bouley says: "Notwithstanding the numerous facts collected from all parts of the world, which speak in favor of the practice of preventive inoculation of pleuro-pneumonia, doubts remain yet in some minds regarding its efficacy, because it is sometimes unsuccessful. There is also another reason. It is that the inoculation is not accompanied with pulmonary manifestations—viz.: that it does not repeat in its form and its seat, the disease from which the inoculated virus proceeds, as it generally happens for other virulent diseases. To remove those doubts and judge definitely, the question of knowing if the pneumonic inoculation truly infects the whole organism, one might

have recourse, it seems to us, to certain experiments, similar to those which are now used for animals which are submitted to the preventive inoculation of anthrax, to find out if they have counteracted immunity from that disease. It is known that this quality once obtained, the inoculation of carbunculous virus, known as very strong, gives rise only to slight phenomena, and even after two or three inoculations the organism becomes perfectly indifferent to the insertion of new quantities of virus, even in large doses. Here is a way to follow to have the effects of pneumonic inoculation: Once done at the tail, the only region where it can be performed with impunity, on account of the intensity of the local phenomena following the insertion of the virus in parts where the connective tissue is loose and ready for rapid infiltration, another inoculation might be made, not at the tail, but upon another of these parts rich in cellular tissue, and allow to appreciate if the caudal inoculation has really been successful in the sense of general infection. In fact, if it has had for result to protect the organism against the plenro-pneumonic virus, as the preventive inoculation for anthrax, the insertion of that virus, no matter in what region, ought to be as harmless as that of carbunculous virus is, when immunity exists. If, on the contrary, this insertion gives rise on the cow inoculated at the tail, to phenomena as serious as those found in animals entirely virgin of all inoculation, proof will be evident that the virus inserted at the tail has been without general effect. This would be a criterion of a great certainty, which, in the case of positive solution, would allow no doubts upon the preventive effect of the caudal inoculation. I will add that once this question settled, it would become possible to take advantage of the obtained immunity by a first caudal inoculation in strengthening it by a second in another region; the organism being sufficiently protected by the first, the other would be performed without danger in any region of the body.—*Recueil de Medecine Veterinaire.*

HUMAN AND ANIMAL VARIOLÆ: A STUDY IN COMPARATIVE PATHOLOGY.

BY GEORGE FLEMING, F.R.C.V.S., ARMY VETERINARY INSPECTOR.

(From the Veterinary Journal, London, England.)

(Continued from p. 329).

HORSE-POX.

I have casually and repeatedly alluded to horse-pox, and it is necessary to again refer to it; as, if what transpired at the Vaccination Conference is to be taken as evidence of our state of knowledge with regard to this kind of variola, we would deserve to be accused of unpardonable ignorance. If for no other object also than to rescue the reputation of Jenner from the charge of error preferred against him in this matter, it would be more than worthy of our attention. It is well known that Jenner expressed himself as of opinion that cow-pox was derived from horses affected with what was then, and is even now, properly termed "grease." But for very many years, and also at the recent conference, it has been denied that there was any relationship between the disease of the horse and cow-pox; and on the latter occasion it is reported that one of the speakers in remarking that "all who were acquainted with the subject were well aware that there were some erroneous views originally held by Jenner with respect to the conveyance of that particular disease (cow-pox) from one animal to another—from the horse to the cow, and that it was in consequence of that conveyance that the cow became affected with a disease that he called cow-pox," added: "In the present day, perhaps, it was unnecessary for him to say that among veterinary surgeons who were acquainted with the lower animals, that opinion had always been negatived. He was of opinion that Jenner saw the disease of the animal, and that it was of a repetitive nature, which by his own observations he was well aware did not possess any particular quality." It is scarcely necessary to remark that intelligent students of veterinary medicine do not negative Jenner's

opinion, but know for a well-established fact that he was justified in that opinion; inasmuch as horses suffer from a malady closely resembling the so-called "grease" (which is simply a kind of catarrhal inflammation of the sebaceous follicles of the skin at the lower part of the limbs), and that this malady is transmissible to the cow and to mankind, producing a train of symptoms so exactly like vaccinia that no material difference can be discerned between the two maladies.

Jenner was too serious a philosopher and exact an observer to make light assertions or superficial examinations, and he only erred when he stated that the one source of cow-pox, and even of small-pox, was to be found in the horse. He was absolutely correct as to a particular cutaneous disease of the horses' limbs being transferred, by means of human hands, to the cow's udder, and there producing cow-pox, which again could be communicated to people and protect them from small-pox. The facts, accidental and experimental, upon which he based his assertion, are unmistakable and indisputable, and the "sore heels" or "grease" he describes as affecting horses and infecting the farriers who shod, or the grooms who attended to them, was nothing more or less than "equine variola" or "horse-pox," a disease which appears to have been far more frequent then than now, probably owing to the insanitary condition in which horses were kept in those days. Reference to his work* will show that Jenner knew more of the variolous diseases of animals than many more recent authorities, and that this "sore heel" disorder, or "grease," was eruptive in character, and could produce cow-pox. * Jenner's discovery—for discovery this really was—was confirmed by Dr. Loy, of Pickering, who, in a little pamphlet which appears to be now quite unknown, † is even much more explicit than Jenner with regard to the nature of this inoculable "grease," and he resorted to direct experimentation to prove the relations between it and cow-pox. His earlier experiments failed, in consequence of his not being able to dis-

* "An Inquiry into the Causes and Effects of the Variolæ Vaccina, a disease discovered in some of the Western Counties of England, particularly Gloucestershire, and known by the name of cow-pox." London, 1798.

† Account of some Experiments on the Origin of the Cow-pox. 1802.

tinguish between the ordinary and the specific malady. At last, he states, he had the good fortune to find a horse on whose heels the matter was much more limpid than in all the preceding ones—on the fourteenth day of the disease, the seventh of the discharge from the heels. Four cows inoculated with this matter showed the usual symptoms of cow-pox, and a child also inoculated with it on the arm on the third day had a papule surrounded by slight inflammation; on the fourth day the papule was very elevated, and on the fifth day there was a purple-tinted vesicle; on the sixth and seventh days the vesicle had increased and was darker. At the same time there was a fever, headache, quickened respiration, frequent pulse, white tongue, etc., which symptoms declined towards the ninth day. On the sixteenth day after inoculation from the horse, the child was inoculated with small-pox matter without result. Loy alludes also to a farrier and a butcher of Pickering, who, in applying dressings to the heels of a horse affected with “grease” became inoculated. Desirous of ascertaining whether the pustules which were on the hands and forehead of the butcher could communicate the disease by inoculation, he inserted some of the matter from one of them into the arm of his brother, who had never had small-pox. The result was exactly the same as inoculating with cow-pox virus. Loy recognized two kinds of “grease”—one merely local and non-infective, the other local and constitutional (eruptive), which gives the disease to those who groom or handle the affected horses. With the first kind there was no general disturbance, but with the second at the commencement the horses exhibited symptoms of fever “from which they were relieved as soon as the disease appeared at the heels, and there was an eruption of the skin. The horse, the matter from which communicated the disease by inoculation, was very unwell until the appearance of sore heels, which was, in all the other cases, accompanied by an eruption over the greater part of the body.” The fact that inoculation from the “constitutional grease” was a protection from small-pox, and that the rather severe effects of direct transmission from the horse to the human species were modified by passing the virus through the cow, or through mankind, was fully recognized by this enlightened

observer; as well as the other important fact, that the matter was only certainly effective when perfectly limpid, which was in an early stage of the disease. Loy likewise remarked that neither the original nor the communicated disease was infectious through the medium of the atmosphere.

The observations of this contemporary of the illustrious Jenner are extremely interesting, while they are decisive as to the intimate relationship existing between horse-pox and cow-pox. Though his pamphlet consists of only a few pages, it contains facts of great moment with regard to our subject, and there is perhaps nothing more astonishing in the whole range of medical literature, and especially that of vaccination, than the oblivion into which the record of his observations immediately fell. The opinion so strongly expressed by Jenner, based as it was on well-observed facts, and the convincing demonstrations (clinical and experimental) of Dr. Loy, do not appear to have availed much in establishing the existence of such a malady as horse-pox. Very long ago a few experimenters, medical and veterinary (among the latter of whom was Coleman)—in order, I suppose, to test the correctness of Jenner's view—attempted to transmit the "sore heels" or "grease" to horses and cattle, but failed, as Woodville and Simmons (mentioned by Loy) had previously done, and for the same reason—they inoculated from the local non-constitutional malady, overlooking the distinction which had been so well drawn by the Pickering physician with regard to the simple cutaneous disorder and the specific eruptive one. Consequently, Jenner was set down as having made a mistake; the existence of horse-pox was denied, and even at the recent Vaccination Conference the same speaker who asserted that veterinary surgeons had always negatived Jenner's opinion, said that Jenner saw the disease of the animal ("grease"), "and that it was of a repetitive nature [*sic*], which by his own observations, he was well aware, did not possess any particular quality. * * With the exception of the sheep, he knew of no other animal that was affected with variola. There was an equine variola which was produced from the cow (?) but he had never seen variola from the horse. He knew it had been stated of late that cases of that disease had occurred in France,

but all he said was that our observations had been extensive and minute, and they had seen nothing approaching to it in a horse or dog, or any other animal except the sheep." Five years before these words were spoken, the horse-pox had been carefully described in English veterinary literature, and the malady had not only been observed on the Continent, but in England and America, and its existence proved over and over again beyond a doubt.

Dr. Loy's pamphlet was translated into French by Dr. Carro, soon after its appearance in England, and published in the "Bibliothèque Britannique" in the year X (vol. xxi.). Carro was a great admirer of Jenner, and he dwelt with much force on the clearness and precision of Loy's experiments, as furnishing indubitable proof of the justness of the opinion of the introducer of vaccination. But Carro, in his eulogistic comments on Loy's work, remarks that the French vaccinators had experienced great difficulty in understanding what the English term "grease" really meant, some thinking it was *javart* (fistula of the foot from injury), or *eaux aux jambes* (simple inflammation of the sebaceous follicles—*vulgo*, common "grease")—"an uncertainty," adds Carro, "which shows what little care the English have observed in describing the *grease*, and is probably the cause of the small progress this interesting portion of the veterinary art has made among them." The French veterinarians and medical men who tried Loy's experiments had no better success than those in England who did not have recourse to the eruptive disease for inoculating material; consequently, in France, also, Jenner and Loy were believed to be in error, and nothing more was thought of horse-pox or "constitutional grease."

But it is curious, in the midst of this incredulity, to find Carro himself adducing most valuable confirmatory proof of the correctness of Jenner and Loy's statements, in a letter addressed to Professor Pictet, of Geneva, in 1803, and published also in the "Bibliothèque Britannique." In this letter Carro writes: "*Les maréchaux-ferrants de Salonique distinguent trois sortes de javart: l'écrouelleux, le phlegmoneux, le variolique. Ce dernier paraît être le même que le grease constitutionnel du docteur Loy, car il est accompagné d'une éruption semblable à la petite vérole. Aussi,*

d'après le rapport des bergers Albanais, les vaches sont elles sujettes dans ce pays à une maladie qui paraît avoir une grande ressemblance avec le cow-pox des Anglais ; et ce que décide la question, c'est que le docteur Lafont, établi depuis longtemps à Salonique, en Macédoine, a réussi à produire la véritable vaccine sur deux enfants inoculés avec le virus pris sur les jambes d'un cheval atteint de cette troisième espèce de javart, quoiqu'il ne produisît aucun effet sur une vache soumise aussi à cette inoculation ; et cette vaccine s'est propagée de ces enfants à d'autres par l'inoculation, avec ses caractères et sa bénignité ordinaires."

And evidence proving the existence of horse-pox was cropping up now and again, though it was not readily accessible to the medical world of those days. For instance, in the spring of 1805, Viborg, professor at the Copenhagen Veterinary School, inoculated a cow with matter obtained from the heel of a horse affected with the specific form of so-called "grease." On the fifth or sixth day on the udder and teats were bright transparent vesicles, with the characteristic areola and umbilicus of cow-pock ; and the cow exhibited a high degree of fever, while the secretion of milk was nearly suspended.* Sacco made similar experiments, and these and his observations are as valuable as Loy's, confirmatory as they were, of the existence of horse-pox, and its ready transmissibility to men and cows, producing an exanthem which could not be distinguished from cow-pock.† In 1830, Professor Hertwig and eleven students of the Berlin Veterinary School, became inoculated through handling horses affected with the disease in the limbs, more particularly. This form of grease—in reality horse-pox—was then prevailing as an epizooty in North Germany.‡ In the same year Professor Ritter, of Kiel, found a man who had been accidentally inoculated in the hand with matter from horses' heels. The vesicle or pustule exactly resembled that of a cow-pox, and from it he inoculated two children ; the result was undoubted vaccine vesicles.§ In this year, also, Dr. Roseudahl,

*"Vet. Selsk. Skifter," vol. ii, p. 137.

† Trattato di Vaccinazione, con osservazioni sul giavardo et Vajuolo pecorini," 1839.

‡ "Med. Zeitung von dem Verein in Preussen," 1834.

§ Pfaff's "Mittheilungen aus dem Gebiet der Medicin." Jahrgang ii. Kiel, 1833.

of Nostorf, had the opportunity of observing the transmission of horse-pox to several men; there was accompanying fever, and in some cases delirium.* Berndt alludes to an instance in which a boy was infected from a horse suffering from the so-called “epizootic grease,” (*épizoötischer mauke*), and from the eruption on him people were inoculated most successfully, fine cow-pocks being developed.† And so on with other instances.

But in every country to which Jenner’s views had penetrated, much uncertainty prevailed with regard to the nature of the disease termed “grease” or “sore heels;” and therefore disappointment only too often followed attempts to transmit it to the cow, and so to produce cow-pox.‡ In Italy, for instance, the term was translated into *giardone*, pedal fistula; and the possibility of producing such a disease as cow-pox from this condition placed the reputation of Jenner very much at the mercy of captious critics.

In 1840, Dard saw the disease among horses in France, and called it *Rhinite pemphigoïde*; in 1843 it was again observed in that country by Bouley, now director of the French Veterinary Schools, who designated it *Herpes phylotenoïde*, to distinguish it from glanders and farcy, which it somewhat resembles. But it was not until 1860 that the discovery of Jenner and the researches of Loy received further confirmation, and scientific attention was seriously directed to it. In the spring of that year the horses in the commune of Rieumes, not far from Toulouse, were attacked with a disease which assumed an epizootic form, and in less than three weeks more than a hundred were affected. M. Sarrans, the district veterinary surgeon, reported the disease as commencing with slight fever, soon followed by local symptoms, the chief of which was hot and painful swelling of the limbs, with an eruption of small pustules on the surface of the tumefied parts. In three to

**Ibidem*. Altona, 1835.

† Rust’s “*Kritisker Repertorium*,” band xxi.

‡ In the nomenclature of disease drawn up by a joint committee of the Royal College of Physicians, and published in 1869, I find “grease” named *Equinia mitis*, and defined as “a pustular eruption produced by the contagion of matter from a horse affected with the grease.”

five days a purulent kind of discharge took place in the pastern, which continued for eight to ten days, during which the inflammatory phenomena gradually subsided; then the pustules desiccated, and towards the fifteenth day the crusts began to fall off, carrying the tufts of hair with them, and leaving more or less perceptible cicatrices. The eruption appeared not only on the limbs, but on other parts of the body, particularly on the nostrils, lips, flanks and vulva. There was no cow-pox present in the locality, and the extension of the disease seemed to be due entirely to contagion. No fewer than eighty mares were infected from being sent to the government stallions at Rieumes, the ropes with which their hind limbs were secured (passing round the pastern) being impregnated with the discharge from the heels of some diseased mare. Only three mares and two stallions escaped attack. One of the animals exposed to infection chanced to be sent to Toulouse, and not appearing so well as usual, it was left at the government veterinary school. It was not until it had been there for eight days that Professor Lafosse observed the mare to be dull, suffering from inappetence, and lameness in both hind limbs, with difficulty in flexing the fetlocks, and a hot, painful swelling, confined to the left fetlock, extending higher on the right leg. On these swollen parts small tufts of hair were erect here and there, and at those places there were what appeared to be pustules, from which exuded a fluid matter possessed of ammoniacal odor, but less fetid than that of steorrhœa ("grease"). Lafosse thought at first that it was only the latter disease in an acute form; and he was happily inspired to inoculate a cow, in order, once more, to submit the Jennerian doctrine to an experimental test. The experiment was made eight days after the manifestation of the eruption on the mare, and was perfectly successful. Papules, then pustules, formed on the cow wherever the matter obtained from the mare had been inserted with the lancet—large, flat, firm and round pustules, with a central umbilicus, which caused the borders to appear raised—they were the vaccine vesicles, in fact. Another cow was inoculated from this one, and had a very fine cow-pox, from which a child and a horse were vaccinated, and these had a magnificent vaccinal eruption. A second child, inoculated with

the matter from this horse, had, in its turn, a well-developed pock. Comparative inoculations were then made on children and horses with the equine virus and the ordinary humanized vaccine, and it was found that the former produced larger and finer pustules than the latter, though their evolution was slower. Lafosse designated the disease the *maladie pustuluse vaccinogene* of the horse.

Bouley, then professor of clinics at the Alfort veterinary school, not quite satisfied with what had been done in this direction by Lafosse and others, resolved to inoculate cows with all the eruptive maladies of the horse, which his daily routine of professional duty brought before him; and, singular to relate, the very first case (in 1863), was a successful one, and produced a beautiful cow-pox. The horse presented the following symptoms: On the inner surface of the lips, on the inferior aspect and free portion of the tongue, on the buccal and gingival membrane and on the floor of the mouth—particularly along the Whartonian ducts—were infinite multitudes of small vesicles, about the size of a pea, some circular, others elongated, and whose opaline tint was in marked contrast to the bright-red mucous membrane on which they were seated. These pearl-tinted vesicles were smooth on their surface, had no depression, and felt rather tense; pain was evinced when they were pressed upon. In some places they were confluent, in others discrete. When they had been ruptured, there were small, lenticular, very red sores, with sharply defined borders. A very abundant saliva, rendered frothy by the incessant movement of the tongue, filled the mouth, and escaped in long masses from its commissures. With the exception of not eating so well as usual, the horse appeared in good health. The symptoms were so different from those described by Loy and Lafosse, that Bouley thought it was an aphthous stomatitis, and that therefore, like the foot-and-mouth disease of bovines, it must be contagious. True to his resolve, he inoculated a cow to see what the result would be, and produced veritable cow-pox, from which children were most successfully vaccinated. For some months other horses were admitted to the clinic of the school, suffering from the same disease, which varied in its symptoms only with regard to the seat of eruption, which was in some instances as in the first case, and in

others as in Jenner's, Loy's and Lafosse's cases. From these multiplied observations and experiments, most carefully watched, and discussed by the most eminent medical and veterinary authorities in Paris, there could no longer exist the shadow of a doubt as to the nature of the disease, which was accordingly designated "equine variola" by Depaul, and "horse-pox" by Bouley himself. Bouley confesses that for years he had met with the disease among horses from time to time, but until Lafosse's experiments at Toulouse he had not suspected its variolous nature.

From time to time outbreaks of the disease have been recorded in France, where it appears to be most prevalent in Paris and in its neighborhood.

So long ago as 1853, I witnessed, in Manchester, a case of inoculation of a farrier who had shod a horse affected with "grease." The vesicle was situated on the chin, and there was great constitutional disturbance.

In "Veterinary Sanitary Science and Police," I have devoted a chapter to it, and in the periodical edited by me, the *Veterinary Journal*, I have alluded to it frequently (particularly in vol. v., p. 81; vol. vii., p. 371; vol. ix., p. 204). A translation is also given of an interesting report by Prof. Ellenberger, of the Berlin veterinary school, of an outbreak of what he describes as "stomatitis pustulosa contagiosa," but which was really horse-pox. In this respect the ready communicability of the disease and its vaccino-genous character is well shown. In a recent number of the *Deutsche Zeitschrift für Thiermedizin*, Prof. Friedberger, of the Munich veterinary school, furnishes an excellent account of an outbreak in that city, and a record of successful experiments. A translation of this paper appears in the *Veterinary Journal* for September, 1880. In German and Italian veterinary literature similar outbreaks are described. For the past two or three years there has prevailed widely among horses in England, Ireland and Scotland a pustular exanthem, very contagious in its character, and known among grooms and others as the "boil disease," the "American boil disorder," etc., which, in some of its features, if not in all, somewhat resembles horse-pox. The eruption in the majority of cases is mainly confined to the trunk. From England

it has been carried to Belgium, where it has attacked a large number of horses. Horse-pox has also prevailed as an epizooty for two years, and is now prevalent at Montreal. Many persons have been accidentally inoculated, and the vacciniferous character of the disorder has been established by medical and veterinary authorities. The outbreak is described in the *Veterinary Journal* for August, 1877. Last October, immediately before leaving my late regiment, the Second Life Guards, I had four cases of the disease among young horses just joined, and my farrier-major was accidentally inoculated on the finger. Surgeon Hensman, of the regiment, considered the case one of severe vaccination. The details are recorded in the *Veterinary Journal* for March, 1880.

So that since 1864, when the nature of horse-pox was forever settled by the observations and experiments of Bouley, and the discussions that ensued thereon at the Paris Academy of Medicine, the history of the malady has been largely supplemented by contributions from observers and experimenters in Europe and America, and Jenner's statement has been admitted by all who have studied the subject to be true, except in one particular—the "horse-pox" or "constitutional grease" being the source of cow-pox. In this only was Jenner in error. The two diseases are perfectly independent of each other. Cow-pox appears where there are no horses, or possible contact with horses, and where the men who attend upon these do not milk cows. It has frequently been observed that horse-pox prevails on a farm or in a locality, and no cow-pox is seen there; while the last-named disease may affect a number of cows in a dairy, and the horses be entirely free from horse-pox. Hering, for instance, states that cow-pox is very far from rare in Wurtemberg, while grease (*mauke*) is extremely uncommon; that men who work horses do not milk the cows, this office being undertaken by women in that essentially milk producing country; and that the majority of the proprietors of cows which had been affected with cow-pox had no horses.* In none of the recorded outbreaks of horse-pox has anything ever been said as to the existence of cow-pox, and no attempt has ever been

* "Gewiss der grosste Theil unserer Eigenthumer von Kuhen mit originare n Pocken hat gar keine Pferde." *Op. cit.*, p.9.

made to establish a relationship between the former and human variola, from which it differs as widely as the latter does from cow-pox. Horse-pox prevails entirely independently of small-pox or cow-pox. In some countries it is often present as an epizooty—as in Lower Canada; while in other regions, where it is enzootic, it will be more common in one part than another—as at Paris, where it is well-known, and at Lyons, where, according to Chauveau, it is not seen.

(To be continued.)

PRIZE ESSAY.

BY J. T. DUNCAN, V.S. (Toronto.)

CONTAGIOUS DISEASES OF CATTLE.

(Continued from page 350.)

PROTECTIVE MEASURES.

The question of what steps should be taken once this plague appears in a country, is of the greatest importance to the community at large. Fortunately, so far, with this question the Dominion has nothing to do. But to be forewarned is to be forearmed, and considering the possibility of its introduction here, the proper course of action should now be determined on, in such an event.

Given the presence of this plague, then, two means of dealing with it present themselves, viz.: "Stamping out" and Inoculation. I say two, for no veterinarian worthy of the name would advise general treatment.

First, as regards "stamping out." The advocates of this system are uncompromising, and will admit of no modification of their method, nor have they much patience with those who wish

to try other means of combatting this affection. Prof. Williams says: "When the disease breaks out in a herd, the affected animals are to be isolated, or if in 'condition,' slaughtered for beef—experience having proved that such beef is good and wholesome if the animal is killed early in the disease."

Dr. Thayer says: "Stamping out is the most effectual and economical method of treating pleuro-pneumonia contagiosa."

Prof. Law says: "We do need a short and speedy stamping out of the disease in every locality where it has gained a footing. All measures which hinder this, whether proposals for investigation, or the impossible but delusive proposition to examine all our cattle while in transit, can but work evil, and only evil, to our live stock interests."

These views have been largely acted on in many countries.

Massachusetts has adopted this plan of dealing with the disease. New York State, and others, are following in her steps. Great Britain has attempted "stamping out" for years. Continental governments did the same till recently, when, owing to the progress of science, they have, to a large extent, adopted inoculation.

Disinfection.—Along with stamping out, thorough disinfection (by burning sulphur, whitewashing with lime, carbolic acid, etc.,) of all sheds and stables must be carried out.

This thorough stamping out, then, is one course open to us if pleuro-pneumonia should appear in Canada.

But in the second course which was mentioned as a means of controlling this plague, viz., Inoculation, we have a policy of protection which is more effective, more scientific, and which can be had at a tithe of the expense of "stamping out."

The use of inoculation as a prophylactic is not new. First attempted by Dr. Willems, in Belgium, 1851, it has since come into great favor in many parts of the world.

A Commission appointed by the French Government to test and examine the system, reported strongly in its favor.

It has produced marvellously good results in Australia, South Africa and the Continent of Europe. So great are its benefits seen to be, that some of the continental governments have made

inoculation compulsory. Notably in Holland have the good results of this measure justified its adoption.

Out of 22,348 cases inoculated on the Continent of Europe, we find that $24\frac{1}{2}$ per cent. were uninoculable, that is, gave negative results; but of the $75\frac{1}{2}$ per cent which showed results, 7.08 per cent lost their tails, 0.24 per cent. suffered from extensive gangrene, and 2.19 per cent. died, while about 1.25 per cent. contracted the disease on being exposed to contagion. This showing, compared with the results without inoculation, in which the deaths are from 30 to 50 per cent., speaks volumes in favor of this measure, which is upheld and advocated by the advanced and progressive veterinarians of the world.

It must not be supposed, however, that, excellent as is the record of inoculation, it has not its opponents. Some leading authorities object that—

1st. The deaths following inoculation are nearly, if not quite, as great as from the disease itself.

2nd. That it is but a means of spreading pleuro-pneumonia; and

3rd. That it does not afford immunity from its attacks.

In answer to these objections, it may be stated, that the first and third are fully answered by the results noted above, while the second has no foundation in fact, it being *impossible to produce pleuro-pneumonia by inoculation, as has been proved by many experiments.*

But, excellent as are the results hitherto noticed, the more recent ones obtained by Mr. Rutherford, V. S., of Edinburgh, eclipse them all.

Of these experiments Mr. George Fleming says (Veterinary Journal, 1879): “Mr. Rutherford’s highly successful, intelligent and scientific practice of inoculation on a larger scale than has, perhaps, ever before been attempted in this country, leaves nothing more to be desired in the way of evidence as to the absolute immunity conferred by inoculation. * * No animal inoculated by Mr. Rutherford has ever been known, no matter how much it may have subsequently been exposed to infection, to become diseased, and the dairymen have no fear whatever in intro-

dancing suspected or sick animals among those inoculated. * * * The question of its efficacy and safety is now beyond discussion or dispute; thanks to Mr. Rutherford, the problem is solved and the freedom of Edinburgh from pleuro-pneumonia at the present time—a condition which has not been known to exist for more than thirty years—is mainly, if not entirely, due to his scientific skill.”

Other authorities and facts might be quoted in support of inoculation, but enough has been said to prove its value, and as it is of the utmost importance that the operation be performed properly (much of the prejudice against this measure being due to ignorance and carelessness) I give Mr. Rutherford's method of operating :—

“ Taking the systemic conditions, first, I find that it is not advisable to inoculate cows immediately before calving. I would not like to do it upon any cow that had less than eight or ten weeks to run; nor is it advisable to do it immediately after calving. At least fourteen days ought to be allowed to elapse, and it should only be done then if the animal has, both locally and constitutionally, recovered from parturition. It should not be done, but deferred if there is the slightest degree of inflammatory action in any part of the body; in short, the animal should be, as far as we can ascertain, well in all respects. It should not be done if we consider the animal to be affected with pleuro-pneumonia; but, at the same time, I must tell you that I have reason to think that there is a stage in the disease, the very earliest, when, if inoculation is performed, good results may reasonably be expected to follow. I do not advise it however.

“ It is not advisable to inoculate in very hot weather; and it is less advisable to inoculate during the winter months, unless special arrangements can be made for maintaining a uniform warm temperature. It is not, in my opinion, advisable to inoculate with any but one kind of virus, and that should always be fresh and free from any foreign matter; nor is it advisable to adopt any modification of the true method of inoculation. I would ask you to note that mild or modified inoculation is not to be depended upon, and should not, therefore, be practiced. I am

of opinion that there is only one mode of inoculation, and shall now describe it.

“The virus or lymph should be obtained from an animal not too far gone in the disorder and free from other diseases. “Lymph” is the amber-colored liquid exudate found in the interlobular tissue (described previously as *clear exudation*. See page 13). It may be obtained by cutting into this clear exudate and allowing it to drain into a vessel below. Too much care cannot be exercised in selecting the lymph, as its fitness is the most important thing in connection with the operation. Select and use, therefore, only the amber-colored liquid free from blood, serum and other extraneous matter. If not used immediately, preserve it by hermetically sealing the bottle.

“Having obtained your lymph, you saturate with it as many pieces of white worsted, eight to nine inches long each, as there are animals to operate on. The instruments used are a pair of strong clipping scissors, a pair of rowelling scissors, and the needle.

“The proper place to inoculate is the tip of the tail.

“In operating you require the assistance of two men and a lad; one man to hold the head, one to distract her attention behind with one hand, while with the other he grasps the tail firmly, while the lad holds the saucer containing the threads ready saturated for use.

“The operator, standing behind the animal, seizes the end of the tail and clips off the hair for five or six inches, only leaving a tuft at the end. Then with the rowelling scissors he makes the transverse cuts on the posterior aspect of the tail, three inches apart.

“The needle is then passed from below out at the upper end, turned round several times sharply to enlarge the channel, threaded with a doubling of the worsted and then carefully withdrawn, leaving the thread in the tail; and after cutting off the two long ends the operation is complete.

“Within two or three days after inoculating, the part becomes slightly swollen, erythematous, but there is no discharge from the orifice. The swelling increases, and the animal is not

able to lift its tail. About the ninth day the skin becomes yellowish, and beads of amber-colored lymph exude, similar to that which was introduced. Occasionally a longer time is required for the exudate to appear; but when it does inoculation is considered to be successful, and the second stage is complete.

“There are now two courses open to the operator, and much of the success of the operation depends on which he will adopt. He may allow the process to run its course, which will generally be gangrene of the end of the tail. I do not advise this process, but find the best plan to be to remove the end of the tail when inoculation is once fairly established. There are cases in which this must be done even earlier, and there are others in which it may have to be accomplished more than once, as, for instance, when the sudden setting in of coldness of the end of the tail indicates the death of the part.

“Carefully examine the end of the tail. The part to come off may not be cold, but it will be wet with exudate and probably somewhat discolored for an inch or so above it. I find that where amputation is practised early, say on the twelfth to the fourteenth day, it is not necessary to make the division more than a finger's breadth or so above the upper incision made in inoculating.

“The amputation should be followed by profuse bleeding; if not, amputate higher up till bleeding follows. Neglect of this measure is apt to be followed by gangrene.

“After amputation many will heal without further inconvenience. In the majority, however, the stump will swell (and so long as it remains warm no anxiety need be felt), suppuration set in, and a small portion of tail thrown off. This, and the formation of abscesses on any part of the tail, are not to be feared. Only wash with carbolised water twice or thrice a day and dip the end of the tail in a strong solution of carbolic acid after milking.

“The abscess following exudate deposit may be an ordinary sequel of inoculation, or it may be the result of external injury. If from an external injury, it may appear on any part of the body. So long as an abscess forms, no danger is to be apprehended; but if instead of abscess you get extension of the exudate, loss of

appetite and symptomatic fever, the case becomes grave, and the animal had better be slaughtered. In like manner should she be treated when the exudate extends to the genito urinary organs.

“Males, young stock and calves, I find from experience, can be inoculated with little or no risk. This is a very important fact; for should inoculation ever become general in the country, the necessity for doing it upon our home-bred stock when brought into dairies would be obviated by their being done at an early period of their life, when the operation, while being equally protective, is attended with little or no risk, and does not call for any after attention.

“I have nothing to say on the subject of diet while animals are under the operation. It only requires to be rather below than above the mark as to quantity for the first three weeks, and calculated to keep the stomach and bowels in order.

“In regard to medicinal measures, if it is deemed advisable to give any opening medicine, the purpose will be fully and efficiently met by the occasional admixture in the soft food of sulphur and treacle.

“This, of course, is with the view of lessening any attendant fever. I have not, however, found that there ever is much, the thermometer rarely rising above 102° F.”

The above remarks do not include Mr. R's experience for 1879; this is found in the following answers to queries addressed to him by Mr. George Fleming:

1st.—Have any of your inoculated animals yet become affected with pleuro-pneumonia?—Answer, *None*.

2d. Have you tried inoculation on any animals but those of the bovine species?—Answer, *I have not*.

3d. Will animals once successfully inoculated take the inoculation as markedly as the first?—Answer, *They will not*.

4th. What is now your average mortality?—Answer, *One per cent*.

Here, then, we have the means of successfully applying this prophylactic measure, and the results of the operation fully set forth by the most successful operator living. He says:* “So cer-

*Address before the Scottish Metropolitan Veterinary Medical Association, 1879.

tain and absolutely protective is inoculation in its effects that I feel confident that, as its practice extends, the dread of pleuropneumonia will cease."

It cannot be doubted, then, that the enlightened practitioner will now, instead of depending alone upon "stamping out" to combat this plague, while carefully segregating his animals and destroying those found affected, will give to the unaffected portion of the herd the protection of inoculation, thereby reducing his losses to the smallest amount.

II.—CATTLE PLAGUE—RINDERPEST.

This affection—fearful as have been its ravages in Britain—we are not likely ever to see in this country. It is indigenous, not in Britain, but in Russia, with which country we have no trade in cattle. It is not known in the United States. In Great Britain it has been "stamped out." But, even did it exist in Britain, we are comparatively safe from its introduction, from the fact that its incubative stage is very short (eight days or less), consequently its presence would be manifest on the stock reaching our shores after the sea voyage. Nevertheless, it is well to be acquainted with its characteristics. The following account has been condensed from the writings of Professor Gamgee, one of the best authorities on the subject:—

"This terrible disease is a very contagious fever, characterized by specific lesions of the intestines, similar to those of enteric fever in man. It is confined to the bovine species, only rarely affecting sheep. It spreads somewhat slowly, and is not very fatal where it originates as an enzootic, but it is propagated very rapidly, and is the most fatal of all cattle plagues when it passes into Central Europe. The disease has a short period of incubation, and is characterized by alarming symptoms, which warn people early of its outbreak. It is not so insidious as pleuropneumonia—not seen in a latent form, therefore, cannot penetrate a country so readily unobserved.

"*Symptoms.*—The first signs consist in dullness, prostration, and a short, husky cough. The appetite is not lost, but is irregular; rumination is also slow and irregular. The animal grinds

its teeth, yaws, arches its back, draws its legs together under its body, and manifests tenderness of the loins. A fever shiver ushers in the next stage. The animal becomes hide-bound, its coat stares, there is still greater tenderness of the lumbar region. The gait is stiff, joints rigid, ears and horns alternately hot and cold; pulse frequent, hard and full; breathing labored, and secretions generally scanty. Rumination is suspended; deglutition performed with difficulty, thirst intense, and mouth hot and clammy. There is a watery discharge from eyes and nose. The eyes are blood-shot, eyelids swollen, and soon encrusted with the dried inspissated secretions from them. Saliva drops from the mouth. If blood is drawn, it coagulates with difficulty. The dry excrement and high colored urine are scanty and discharged with some difficulty. The abdomen is tense and tender. In cows the secretion of milk is stopped. In some cases general emphysematous swellings form at this period, and there are exacerbations of all the symptoms towards night-time. This stage lasts about three days.

“The symptoms increase in severity. Diarrhœa supervenes, great weakness appears. The pulse is 90 to 100, weak and indistinct at the jaw. The discharge from the nose and salivation increase. The cough is softer, and on the buccal and schneiderian membranes, as well as in the clefts of the feet, a vesicular eruption is seen. Ulcers result wherever the vesicles burst.

“An unfavorable termination may be looked for when the body becomes cold, breathing quick, exhalations foetid, fæces (fluid or bloody) discharged involuntarily, abortion in cows, and symptoms of sensibility or consciousness lost. The animal dies from the third to the tenth day of the development of the disease.

“In favorable cases there is an early diminution in the severity of the symptoms; the diarrhœa is not severe, and there is a pustular eruption over the body, or a desquamation of cuticle. The convalescence is long, and may last several weeks.

“*Post mortem appearances.*—In the first, or catarrhal stage, the lesions are not characteristic of the disease, but, taken in connection with the history of the outbreak, may assist materially in diagnosis. The mucous membrane of the fourth stomach, es-

pecially near the pylorus, as well as the lining of the small intestine, is swollen, and shows red spots or streaks. The surface of the membrane is covered with a viscid, tenacious, reddish or bloody secretion, which is more or less mixed with the intestinal contents, and in the sub-mucous tissue there is a turbid semi-fluid exudation. In the large intestine only redness is noticeable, especially of the cœcum.

“In the second stage the lesions are more characteristic. There are numerous patches of yellow exudation most abundant near Peyer’s patches, but also seen in the fourth stomach, near the pylorus. Peyer’s glands themselves have a perforated appearance, and in the vicinity of these reddish yellow deposits around the glands there is a sort of catarrh or secretion from the mucous membrane.

“In the third stage the exudations or deposits spoken of get loose from their periphery towards the centre. They become soft, adhere in the centre, their edges floating, till at last they get quite free, and are discharged with the excrements. The portions of membrane from which these sloughs have separated are red and ulcerated, but the ulcers are not usually deep.

“The other organs of the body do not indicate any specific change. There is more or less redness and tumefaction of all the mucous membranes. The heart is soft and flabby, the lungs normal or slightly congested, the liver dark in color, its ducts and bladder full of bile. The mesenteric glands are apt to be swollen, and contain a yellowish red exudation, and may attain twice their natural size.

“*Treatment and Prevention.*—The curative treatment of this disease has failed as a rule. Preparations of chlorine, iron, or neutral salts, have been used, and only with success in mild cases, and especially in Russian cattle.

“The prevention of the disease when it is known to originate spontaneously, or to exist constantly, is sometimes attempted, by inoculating the cattle, a practice recommended first during the last century, when the disease appeared in Britain.”

When, however, the disease enters a country like our own, it is proper and prudent to kill out the diseased and infected animals, and prevent contagion by all known means.

III.—ECZEMA CONTAGIOSA (WILLIAMS); ECZEMA EPIZOOTICA (WALLEY)—FOOT AND MOUTH DISEASE.

Of the diseases hitherto spoken of, this is the only one which has been seen in Canada. "Last year (1875) we had an outbreak of foot and mouth disease in Ontario. It came through the medium of some sheep imported from England in the month of August. They were shipped from England (Liverpool, I believe,) apparently healthy, duly inspected and furnished with a clean bill of health (one of the fallacies of inspection.) When at sea several days some of them were noticed to be lame and sore, and the attendant thought they were cases of "foot rot," or, perhaps, simple bruises. These sheep were brought to the Province and located on two farms, sixty miles apart. The cattle on these and neighboring farms soon became affected with *eczema epizootica*, and there was considerable excitement in the districts so infected. On the part of the Ontario Government, I was requested to investigate the circumstances connected with the appearance of the disease, and also to adopt measures to prevent its spread. In all about 200 head of cattle were affected, and I had no difficulty whatever in tracing the origin of the disease to the sheep already referred to. * * Of course I recommended isolation and no intercourse with the farms where diseased animals were, and in a few weeks its progress was arrested. The cold weather came on, and I assure you our Canadian winter proves the best of disinfectants." *

Definition.—A highly contagious and infectious febrile disease, associated with a vesicular eruption in the mouth, between the pedal digits and around the coronets.

* * In milch cows, it sometimes happens that a vesicular eruption occurs on the mammary gland, and within the lactiferous ducts. When such occurs, the milk contaminated by the vesicular discharge is rendered unfit for use either as food for the human beings or the lower animals.†

* Prof. Smith in Veterinary Journal.

†Williams.

Symptoms.—"Unlike rinderpest or pleuro-pneumonia, which are almost confined to the ruminantia, contagious eczema affects cattle, sheep, pigs, dogs, poultry, and even human beings;" cattle, however, suffering most.

After a period of incubation varying from twenty-four hours to three or four days, the invasion and progress of the disease are characterized by the elevation of the temperature of from two to four degrees; by the formation of vesicles, varying in size from that of a sixpence to that of half a crown, on the tongue, inside the lips, roof of mouth, and sometimes on the udder, whilst smaller blisters are apparent between the digits and around the coronets and heels, the animal at the same time presenting signs of uneasiness in the mouth and feet. * * In a short time the epithelial and cutaneous structures enclosing the vesicles are separated from the vascular structures and are thrown off in more or less rounded patches, leaving raw surfaces, which are, however, speedily recovered by epithelium. In some cases there is entire separation of the hoofs from the feet. It was at one time believed that an animal which had once suffered from eczema contagiosa was guarded against another attack. This is not the case, however; but one attack generally gives immunity during that season. Even this latter rule, however, is not an invariable one, as some animals will take it several times the same season.

Treatment.—Mild cases require but little medical treatment. If the mouth be sore, give plenty of cold water, in which may be dissolved a little nitrate of potash as a febrifuge. Soft, easily masticated food must be given in every case. Watch the feet carefully; if suppuration occurs, remove all detached horn and dress with mild astringents. "What I usually prescribe is an ounce of the concentrated solution of pure carbolic acid, one part to sixteen hot water, to twelve of white lotion; pledgets of tow dipped in this are to be bandaged on. This simple expedient, so generally neglected, will often prevent a lameness of many weeks' or even months' duration." If great weakness is manifest, stimulants, as brandy, whiskey and spirits of nitrous ether must be administered. In all instances bleeding, purging and other depleting measures are to be avoided. The bowels, perhaps consti-

pated at first, become loose as the disease advances; their condition is not to be interfered with, as frequently the morbid material is thus expelled. If the structures of the feet slough extensively, they must be treated by solutions of chloride of zinc or carbolic acid, say one of acid to eight of oil.

Sheep lose flesh very rapidly while suffering from foot and mouth disease. They suffer more in the feet than cattle, and consequently require more careful vigilance. It is a good plan to cause the affected flock to walk through a shallow trough containing the above named weak astringent and antiseptic solution once or twice a day. And, finally, it is my opinion that both cattle and sheep ought to be washed before they are allowed to be driven on a public road, or exposed in a market if they have recently recovered from this disease. It may be difficult to do this with large herds of young cattle, and its compulsion would be considered a hardship, but of two evils it is incomparably the lesser.*

IV.—VACCINE VARIOLA.

In speaking of contagious diseases of cattle, I have adopted Williams' classification of those diseases.† By this classification only *variola vaccina*, or cow-pox, remains to be considered.

Definition.—A contagious, febrile and eruptive disease, resulting from the presence of a specific poison, which is reproduced and multiplied in the animal body during the course of the malady.— * * * WILLIAMS.

Cow-pox and the small-pox of man are undoubtedly identical, as has been proved by inoculating cows with the lymph of human small-pox, as well as by other experiments, such as enveloping cows in blankets in which small-pox patients lay. *Variola vaccina* has been produced by these experiments.

There are many forms of eruption in the udder of the cow which may be confounded with those of *variola*, but those of *variola* have certain special characteristics. The local symptoms of true *variola* are heat and tenderness of the teats for three or

* Abridged from Principles and Practice of Veterinary Medicine.

† Principles and Practice of Veterinary Medicine.

four days, followed by irregular pimply hardness of the skin, more particularly about the base of the teats.

The pimples may sometimes be felt in five days after communication; they assume a red hue when about the size of a pea, are very painful and hard, gradually increasing in size, and in three or four days attain that of a horse-bean. They rise in the centre, become more or less pointed, containing at first a clear, and ultimately a turbid fluid. If the vesicles are broken, troublesome ones supervene, the discharge from which will communicate the disease to the milker, if he is not protected by previous inoculation. The pustules become depressed in the centre, and dry scabs form on the surface. Some of these slough, leaving a raw surface.

The crusts, if left undisturbed, become thicker, and spontaneously separate in about three weeks, leaving a small depression or pit.

In hot climates, *variola vaccina* is sometimes fatal, but in temperate climes, there is but slight diminution of milk, with almost no loss of appetite.

When a disease breaks out in a dairy it is apt to spread to the whole herd, unless affected animals are separated from each other, and different attendants employed.

The milk should be drawn off with a syphon, and if the mammary gland be much inflamed, it should be thoroughly fomented, and dressed with a cooling lotion; a saline purgative (or laxative rather) be given, together with nitrate of potash dissolved in the water.

As a general rule, no medicinal measures are required, however.*

I have thus passed briefly in review the contagious diseases of cattle. Press of professional duties has prevented me giving the time to the subject that I could have wished to devote to it; but I hope that in these pages will be found the *practical* questions in connection with the disease, discussed with sufficient fulness and clearness to repay their perusal by all interested in the conservation of our present immunity from them.

* Prof. Williams.

SOCIETY MEETINGS.

THE MONTREAL VETERINARY MEDICAL ASSOCIATION.

This association held its usual fortnightly meeting in the lecture room of the Veterinary College, Union Avenue, on Thursday evening last, the president, J. C. Alloway, Esq., V.S., in the chair, and a full attendance of members was present. After the usual preliminary business had been disposed of, the members proceeded to ballot for the candidates proposed for membership at the last meeting, which resulted in the election of the following gentlemen:—Messrs. A. W. Clements, R. T. Whittlesey, T. J. O'Connell, Alfred W. Mears, James Brodie, J. A. Duncan, B. A. Pomroy, W. Lemay, George W. Goetz, C. B. Robinson, L. H. Bergeron, P. Paquin, T. Paquin, Pierre Gadbois and V. T. Danhigny, V.S. Messrs. E. Crevier and Philias Labell were then proposed as members to be balloted for at the next meeting. The Chairman then announced that a very interesting communication had been received from M. J. Tracy, Esq., M.R.C.V.S., of Milwaukee, Wis., of a case of "intestinal umbilical fistula," which had been successfully treated by that gentleman, and called upon the Secretary to read same to the meeting, which was listened to with marked attention, followed by an interesting discussion, the members complimenting that gentleman upon the skill with which he had treated the case. The Chairman then called upon Mr. C. H. Ormond to read his communication on the subject of "Purpura Hæmorrhagica." The reader described several cases, being part of a large number successfully treated by him during an epizootic attack at Milwaukee, Ill., last summer. He described the symptoms, which were variable, and his mode of treatment, which was peculiar to the different phases of the disease. He could not assign any definite cause of the outbreak, but thought it arose from some septic matter contained in the atmosphere. The communication gave rise to an interesting discussion.

Prof. McEachran then addressed the meeting on the subject

of "Tuberculosis." He explained the importance of the subject to the veterinary profession, owing to the alarming increase of the disease in the finer breeds and more valuable cattle, especially among the shorthorns, Devons, Ayrshires and Alderneys. Instances could be adduced of valuable herds being decimated, and the owners ruined by it. He explained the pathological anatomy of tubercle, and pointed out the fact that it was a common error in both professions to suppose that caseation was always to be taken as tubercle. He explained that this degeneration of fluid, such as pus or that form of caseation so easily induced in rabbits, erroneously called yellow tubercle, was not really so. When an animal was inoculated with tubercle it invariably became tuberculous, and while septicemia or blood-poisoning may result from inoculation with simple caseous substance, tuberculosis never did. He next drew the attention of the members to the experiments of European investigators, which went to prove conclusively that tuberculosis was communicable from one animal to another by ingestion of tuberculous matter, by the flesh and fluid of tuberculous animals, by the milk, by the expectorated sputum, and by the stalls and feed boxes in which tuberculous animals have been kept. The reports which were read of experiments to prove these facts, were very conclusive. The hereditary nature of the disease was long known. It was, therefore, clearly the duty of this profession to advise stock-owners not to trifle with this insidious plague in their herds, but to take the only safe plan to rid themselves of it, which is not only not to breed from them, but to kill them off and bury or burn their carcasses. The disease was now far more common than it ever was, because cattle breeding was now more extensively carried on, and he felt convinced that it was spread and bred through ignorance of its nature.

In this paper it was not his intention to speak of it in a sanitary point of view, but he could not conclude without remarking that what is true of its communicability from one animal to another is also true of its communicability to the human family, and where the milk or flesh of consumptive cattle was allowed to be eaten by people, he had no doubt that the disease would be communicated in many instances. True, the gastric fluids were all-powerful

in destroying infecting principles, but to the speaker's mind there was no safety to a community, especially to children, where flesh or fluid containing the elements of such a disease as that under consideration were allowed to be sold unrestricted. The advantage, therefore, of a well-regulated abbatoir, under a thorough system of scientific inspection of all animals killed for public consumption, were evident; and of no less importance was the supervision of all public dairies, and the periodic inspection of the cattle supplying our children with a fluid which constituted the chief article of their diet. In the discussion which followed, in reply to the question, "Why was it that consumption was so rarely seen in children?" the speaker said it was a mistake to suppose such was the case; who can tell how many of those cases of tubercular spinal meningitis, which were, alas! too common, and in which no tubercular family history could be traced, were produced by the milk of a tuberculous cow? It was now well understood that in many of the cases of so-called cholera infantum, miliary tubercles were found to exist. It must not be forgotten also that consumption in the human family, even in the hereditary form, generally developed in early adult life, and there is no reason why it should not develop sooner when the contagion was received in another way than by the blood of the parent.

For the next meeting, November 12th, Mr. C. J. Alloway, V. S., will read a paper on "Sanitary Measures," and Mr. E. J. Carter will communicate a case of "Pleurisy."

After a vote of thanks to the essayists, the meeting was brought to a close.

EXCHANGES, ETC., RECEIVED.

HOME EXCHANGES.—National Live Stock Journal, Medical Record, American Agriculturist, Prairie Farmer, Ohio Farmer, Practical Farmer, Surgical Reporter, Bulletin of the National Board of Health, Scientific American, Turf, Field and Farm.

FOREIGN EXCHANGES.—Gazette Medicale, Annales de Belgique, Archives Veterinaires, Recueil de Medecine Veterinaire,

Veterinarian, Veterinary Journal, Revue fur Thierheilkunde und Thierzucht, Clinica Veterinaria, Revue Dosimetrique, Revue d'Hygiene, Journal de Zootechnie, Schweizerisches Archiv fur Thierheilkunde und Thierzucht.

Books.—Contagious Diseases of Swine and other Domestic Animals, (U. S. Dept. of Agriculture), Horse's Teeth (by W. H. Clarke), Bulletin de la Société Cultrate de Médecine Veterinaire, Bericht uber das Veterinarwesen in Konigreiche Sachsen fur das Jahr, 1879, Die Kanigliche Thierarzneischule zu Dresden in dem ersten Jahrhundert ihres Bestehens.

JOURNALS.—The Gazette (Montreal), News and Courier (Charleston).

CATALOGUE.—Catalogue of Blossom Farm (Mobile).

AMERICAN VETERINARY REVIEW,

JANUARY, 1881.

ORIGINAL ARTICLES.

CASTRATION OF THE COW.

PAPER READ BEFORE THE NEW YORK STATE VETERINARY SOCIETY.

BY HUBERT T. FOOTE, D.V.S.

The technical term applied to castration of the female is ovariectomy. Among the laity it is known as spaying. The definition of these terms is the extirpation of the essential organs of generation, which are the ovaries. Before presenting my experiences in this operation during the past summer, I will give a cursory review of the history of ovariectomy from the time of its origin, for which I have referred largely to J. Gourdon's most excellent "Treatise on the Castration of the Domestic Animals." The place and epoch of the origin of the operation is unknown. It is mentioned in the Jewish book, Talmud, prescribing the castration of the female in general, but, according to Aristotle, Pliny, Galien and Elien, the camel and sow were the only animals in which it was allowed.

The first reliable documents which we possess on this subject are by Oliver de Serres, showing that the operation dates back to at least the 16th century, when it was practiced for the purpose of fattening the animals and improving their meat. It has been practiced to some extent in all of the European countries since, but very little, until Thomas Winn, of Natchez, Miss., in the year 1831, discovered its utility in increasing the flow and quality of the milk by operating on the cow about one month after calving. He died without making his discovery publicly known, but having described it to a traveler, his results were carried to Europe, where Mons. Levrat was the first to experiment in the operation. Many other Europeans soon followed him in this practice. Noticeable among them was Mons. Charlier, who devoted his life to its further development, and is credited with being the first to perform ovariectomy by the vaginal method. As to the different modes that have been employed in performing this operation, they have been varied in one respect, that is, in the manner of removing the ovaries. Only two methods have been employed for entering the abdominal cavity, one being through the flank, while the other is through the vaginal walls. Levrat, who was the first to give his experience on the castration of cows, operated through the left side, without preparing the animal save by depriving her of her morning meal. He made his incision through the flank vertically, half way between the external angle of the ilium and the last rib, and removed the ovaries by scraping the vessels, fallopian tubes and ligaments with his thumb nail until those organs were detached, or, as he removed them at a later period, by means of torsion, twisting one at a time, the three small ligaments attaching the ovary to the broad ligament until they broke, when that organ would come away readily.

Among other operators, opinion varied as to the best side in which to make the incision, Charlier favoring the right, in consequence of the danger of injuring the rumen in entering the left flank, or of after-adhesion of that organ to the wound, which would interfere with the free exercise of its functions—inconveniences not to be dreaded on the right side. While Levrat made the incision through both the skin and the abdominal mus-

cular wall at one stroke, and only large enough to admit of the passage of one arm, Charlier recommended the incision of the skin, then, layer by layer, of the abdominal muscles, making the opening large enough for the passage of both of the arms, claiming it as more expeditious, using both hands to extract the ovaries, less fatiguing, safer, and injuring the broad ligament and connections less, while the wound healed as quickly as the shorter one. He tore or twisted the ovaries off after breaking the ovarian ligaments, which is the method still used by the many gelders and spayers that are now traveling over our country. As to the incision, I believe that most of these latter make it on the left side, and large enough to admit one arm. The pain in this mode of operating is very great and acts sensibly upon the organism of the animal, increasing the fever and diminishing, in consequence, the secretion of the milk when it does not result in death. The symptoms following, are like those which will be presently given in describing the vaginal method of operating, but much more aggravated, the animal being sick fully twice as long, with the addition of the symptoms peculiar to the external wound, which are, about the third day, tumefaction, and great tenderness with organization of plastic lymph between its lips.

The accidents following the operation by the incision of the flank are principally: emphysema in the external wound, hemorrhage in this wound, prolonged reactional fever, suppuration of the wound, hemorrhage from the ovarian arteries, peritonitis, return of the rut in the animal.

The emphysema is the most ordinary but least grave of the preceding complications. It appears immediately, or a few hours after operating, in the form of a diffuse tumefaction, variable in extent, sometimes reaching the shoulders and back, and even the opposite side of the body. It is supposed to originate from the expulsion, through the wound, of air which was taken into the abdominal cavity at the time of operating, by the action of the diaphragm. This air spreading in the sub-cutaneous cellular tissue may dissipate itself, or the skin may be punctured and the air pressed out.

The next complication, hemorrhage from the wound in the

flank, comes from the division of the circumflex iliac artery, and sometimes is alarmingly abundant. The suturing of the wound generally stops it, but it is better to ligature or twist the bleeding vessel, as there is danger of the blood running into the peritoneal cavity and causing further complications.

Suppuration of the wound always arises when the healing is not by first intention, and only causes a delay in the healing, except when gangrene sets in, which almost always results in the death of the animal. Another danger from this complication, that may be noted, is the extension of the inflammation, in this case excessive, to the internal organs.

The last three accidents following the operation, I will leave until I take up the operation per vagina, as they are common to that method also.

And now, says Mons. Gourdon in his work on this subject, to these divers complications must be added the necessity of binding the cow by means which torment, irritate and wound her;

The difficulty of the operation, in which one tears with the fingers the ligaments which hold the ovary, exposing the operation to failure from practicing it in an incomplete manner;

The acute pain from cutting the skin and muscles, a pain causing bellowing and struggling, and which aggravates the general condition of the animal, increasing the extent of the reactional fever, &c.;

The fever of reaction itself, extending sometimes with irritable subjects to such a high degree that it is accompanied with nervous symptoms, constipation, diminution of the secretion of the milk, and reacting always in an unfavorable manner after the operation;

The *extent*, the *difficulty of healing*, of this wound in the middle of the flank, through muscular folds, aponeurosis, cellular and serous tissues crossing one another diversely, and which may be injured with the arm in seeking the ovaries;

Finally, the *mortality* in consequence of the action of these divers causes, which cannot be estimated at less than from 15 to 18 per cent. of the total subjects operated upon, itself explains why the method by the incision of the flank, after numerous more or less unsatisfactory attempts, has been completely abandoned.

Next, we will consider the operation per the vaginal incision. This method was first practised in 1850, the priority being claimed by two veterinarians, Mons. Pranger and Charlier; and while it has never been satisfactorily proven to which the discovery of the operation does belong, it has generally been conceded to the latter, as he was the first to explain the method of operating, which he did July 29, 1850, before the Academy of Sciences. His method at that time was as follows: After securing the cow in a standing position, he thrust his left hand into the vagina; then, stretching the superior wall of that organ, he inserted his right hand, in which he held a concealed knife having a short blade with a concave edge. With this instrument he made an incision through the superior wall in the median line, commencing about two inches above and behind the os uteri, and extending it for about three inches backwards. Through this incision he passed the thumb, index and median fingers, with which he grasped one of the ovaries, drawing it into the vagina, where, with torsion instruments, he twisted it from the broad ligament, and then treated the other ovary in a like manner. Several improvements were made from time to time, Charlier himself experimenting considerably with different instruments for dilating the vagina, and finally adopting—instead of the fixed pincers for holding the broad ligament firmly, while the torsion pincers twisted the ovary off—a thimble to be placed on the thumb of the left hand, and to answer the same purpose. This caused less injury to the broad ligament by his being able to regulate the stretching of that delicate membrane, besides avoiding the danger of fatal hemorrhage from the ovary breaking away on the third or fourth turn, and the ligament then untwisting itself, as sometimes happened. Later, Charlier substituted the *écraseur* for the pincers, which is the instrument now used for extracting the ovaries. He perfected the operation by this method to the extent of reducing the mortality following to not more than one per cent. The operation of Mon. Colin, another experimenter, was essentially the same as Charlier's, that is, by torsion; but he contrived simpler and cheaper forms of instruments for that purpose. Pranger's operation differed from that of the others only in the ligaturing of the ovarian

arteries. But this method, while being a sure preventive from hemorrhage, produces a much greater liability to peritonitis from the irritation caused by the threads which are brought out through the vaginal opening.

By the numerous experiments with ovariectomy in France, and close observation following the operation, it has been proved to be useful in curing nymphomania, in sterilizing cows that give only an inferior quality of offspring, as well as those that are predisposed to abortion or difficult parturition, and placing those as well as the unfruitful and old cows, that are no longer desirable for reproduction, in a condition for fattening, at the same time bettering the quality of their meat. Charlier claims that after spaying a cow gives double the quantity of milk; but for this he only encourages it as a special industry, as in the dairies. The operation can be practised with profit only on such cows as have produced all the calves wanted from them, are destined to furnish milk and finally meat for the butcher, or which, on account of sickness, age, or otherwise, can no more be used for reproduction, and have no other destination than the abattoir.

For fattening purposes, according to Charlier, the operation should be performed when the cow has attained the age of from six to eight years, after she has calved two or three times, and then she will be ready for butchering in about a year. He does not advise waiting longer, as the old cows give poor calves, in which the bony system predominates, give less abundant and less nutritive milk; they do not fatten easily, sometimes not at all, besides their meat is hard, fibrous and of inferior quality. Young cows, on the contrary, give better calves, more robust and less bony, more abundant and a better quality of milk, fatten more easily, and furnish a superior meat. In operating for the superior milking qualities, he considers forty days after the second or third calving to be the best time, as the cow then gives the most milk, and its advantages are more enduring. The meat is better in cows operated on for milk first, than where they are operated on especially to fatten; that is, if the cows are dried up before butchering; for if they are killed while giving milk the meat is not as good, the milk depriving it of much of its juiciness and flavor.

Ovariectomy has received but very little attention in this country, and no extensive scientific experimentation has been carried on. The operation per vagina is comparatively unknown amongst the mass of our veterinarians, and the operation through the flank little resorted to except by the spayers and gelders. They claim a very slight mortality, only one or two per cent., as the result of their operations, but facts prove that they meet with a very much larger percentage of loss, even considerably above that estimated by Gourdon, in France—15 to 18 per cent.

Our esteemed associate, Dr. Liantard, some ten years ago imported from France a set of the latest Charlier instruments, and met with very gratifying success in many cases in which he practiced the operation. His experience was presented to the U. S. Veterinary Association, and is the only report of the kind, of which I have any knowledge, that has appeared in this country. The instruments consist of a concealed knife with a short concave-edged blade, a speculum and a long straight ecraseur. The speculum is inserted into the vagina, holding it with the left hand and directing it with the right, to prevent injuring the mucous membrane of that organ. The projection on the end of this instrument is then inserted into the opening of the os uteri, and the right hand withdrawn to procure the concealed knife. This is passed into the vagina, and while pressing downwards and forwards on the speculum the incision is made in the same way that Charlier made it. However, I found that an incision large enough to admit the index and median fingers sufficed as a rule, instead of including the thumb as Charlier did, using those of the right hand in seeking the left ovary and vice versa. These fingers are then passed over the uterus, run along the cornua on whichever side you are seeking the ovary, then the fallopian tube is followed until the ovary is reached. This is brought gently to the opening in the vagina, where the thumb, though within the vagina, is carried back of the ovary, which organ is then readily shoved through the small but elastic orifice. The ecraseur is now inserted into the vagina by the independent hand, and the ovary and as much of the cord and broad ligament as is possible is introduced into the inclosure of the chain. Traction is now begun on the

chain by means of the screw without. This should be carried on slowly and under no circumstances should any drawing back of the instrument be practised, for this would produce strain upon the broad ligament. After both ovaries are extracted, whatever blood clots remain in the vagina may readily be removed by the hand.

(To be Continued.)

NEW RESEARCHES UPON PLEURO-PNEUMONIA AND ITS PREVENTIVE INOCULATION.

BY DR. WILLEMS.

(Continued from page 361.)

B. The contagion of peripneumonia is again proved by this circumstance, that its spreading has been followed from its source in the remotest parts of the world.

Its first appearance, so far as we know its origin, was in 1750. This terrible scourge, which was to prove so disastrous, came from the mountains of Switzerland, passing on one side, on the Jura of the county of Berne, and on the other on that of France. From there it successively spread towards Germany, Holland, Italy, Belgium, England, America, &c., and more recently towards the Cape of Good Hope and Australia. The dates of the invasion in these different countries are well known.

It is thus that it will appear in others where it is at present unknown; for where no diseased animals have been imported, it will never be seen. This scourge has been unknown, in all the countries where it exists at present, until the introduction of a sick animal. Still, in those countries the conditions of climate, of stabulation, alimentation, &c., are absolutely the same as those in which it prevails as an epizootic.

As rinderpest, born in the steppes of Russia, sometimes is spread in countries where there is a great trade in cattle, and in war times especially, when it follows armies in the places of sup

ply, and thus transmits the contagion from the east towards the west, as we have seen, some years ago, a sad example at Hasselt; in the same manner pleuro-pneumonia is spread in an inverse direction; it travels from the centre of Europe towards northern and more rarely towards oriental countries, where it is always transported from the west. Once introduced in a country, it makes it its home and cannot be extirpated except by the most rigorous hygienic measures; it is propagated by contagion from one animal to another, from one stable to another, and that especially in countries where the trade in cattle is very active, and where administrative and sanitary measures are less rigorously observed.

In a stable or in a herd, the contagious principle is spread over all the animals in the same way as the sun and light are. They have not all the same receptivity. This is why I have often seen the animals most distant from the affected subject afflicted first, and those which were nearest to him later. The disease may also be transmitted from one stable to another through the medium of the air loaded with the contagion; the transmission can also take place at long distances, as observed by some. This fact was confirmed by the experiments of the French Scientific Commission and by a very curious observation of Mr. Sluys, of Bernesters, reported in the *Landbouw Courant* of April 14th, 1870.

C. Contagion has been rigorously demonstrated, and spontaneity has not as yet. In favor of the last, there are only probabilities so far; the disease has never been created by the means of determined circumstances. Any attempt made to produce it spontaneously has failed, and the diverse circumstances in which animals were placed while under experiments, have only produced in them a greater disposition to become contaminated and to a shorter period of development.

All imaginary causes, so invoked by the spontaneites, such as bad stabulation, warm and damp and bad stables, too rich and exciting feeding, residuum of sugar houses or of distilleries, exposure to cold and damp air, too abundant secretion of milk, excessive work in oxen, &c.—all these causes, single or collected, have never given rise to a case of pleuro-pneumonia.

This terrible scourge carries on its disasters as well amongst the magnificent herds of the Netherlands and Australia, in the handsome stables of London and Paris, as in the infected barns of the distilleries, where cattle are so closely packed together and often exposed to many privations. Never in any of the most opposite conditions has a single case of spontaneous pleuro-pneumonia ever been recognized.

Numerous experiments have been made with the effect of making the disease appear spontaneously.

Here are those made by the official commission of Prussia, published in *Der Landwirth*, of Dec. 6th, 1871, and reported by Dr. Ulrich, Royal and Departmental Veterinarian at Breslau. He says: "Pleuro-pneumonia ought to be considered as contagious. The experiments of the Agricol Society of Ober Barmen and many others, and the official commission of Prussia, have proved evidently that the disease is communicated very easily by contagion. Doctor Krauss, reporter of the committee of the Agriculturists' meeting in 1873, to decide the question, warmly opposed the fact that pleuro-pneumonia was contagious, and the next day, from observations made at Mœglin, was obliged to acknowledge his error. In the same way, Doctor Wagenfeld, Veterinarian of Dantzic, published an article, generally considered as the best of its kind, in which he opposed the idea of contagion, and still, in his Veterinary Encyclopedia, published later, changes his views and declares it to be very contagious.

The Royal Agricultural Academy of Mœglin proposed to resolve the problem whether pleuro-pneumonia was only contagious or spontaneous, and made experiments which lasted 10 years * * * and, says Mr. Ulrich, "have proved that the disease never appeared with us spontaneously, but always by introduction of a sick animal and spreading of the disease by contagion." Bouley writes the same opinion (*). Prof. Gamgee says, in his report to the United States Government, "pleuro-pneumonia rises only by the influence of contagion." The commission of the Netherlands is of the same opinion. In

* Recueil de Medecine Veterinaire, Sept. 15, 1870.

the meeting of Nov. 3d, 1878, all the Veterinary Societies of northern France expressed the opinion that "it can never rise spontaneously."

By the above it is proved that pleuro-pneumonia proceeds exclusively from contagion, and consequently it belongs to veterinary science to indicate the measures to be taken to stop its spreading, and it becomes the duty of the government to prohibit the transport and sale of suspected animals, as they are the sources from which contagion proceeds through expired air, discharge from the nose, soiling of trucks, &c., &c.

II.

Exudative pleuro-pneumonia is inoculable and infectious; it is transmissible from one animal to another by inoculation of the pathological products and by contagion or volatil virus. When in 1852, I proclaimed the inoculability of bovine pneumonia, I met with many who were incredulous. However, since then, M M. Villemin, Chauveau, Saint-Cyr and others, have admitted the probability of inoculating diseases of the chest, and especially pulmonary phthisis, the best known and unfortunately most spread, as it carries off one fifth of the population of the globe.

Exudative pleuro-pneumonia depends for introduction into the economy of the virus or contagious principle, no matter how, either through the intermediate of the air, upon the mucous membrane of the bronchia and lungs, perhaps even also upon a denuded part of the body of the animal, where absorption can take place, either by direct inoculation in the cellular tissue of the dermis, or anywhere else.

Once introduced in the body of the animal, the contagion produces first a local alteration of the tissues, an inflammatory process, soon followed by general troubles which are the manifestation of the disease. But what is the cause of this inflammatory process? It is not an ordinary inflammation of the tissues; it is peculiar and specific.

Pleuro-pneumonia is a general disease, accompanied with fever, manifested by chills, dullness, tympanitis of the abdomen, first

constipation and then foetid diarrhoea, sometimes convulsive motions of the head and body, grinding of the teeth, &c.

In the affected tissues, one finds infiltration of a matter of exudation which fills up the connective tissue, either ordinarily in the lungs, when the disease is taken by contagion, or upon the point where inoculation has been made. Infiltrations of serous liquid are often seen when pleuro-pneumonia is in an advanced stage, as also after inoculation, in the pleura, pericardium, peritoneum, cellular tissue surrounding the trachea, in the liver, the muscles, etc.

When the disease is far advanced, it affects almost all the organs, as proved to me by the numerous autopsies I have made; even muscles are impregnated with a gelatinous exudation.

This plastic exudation may be carried anywhere else than the lungs; it is not even absolutely necessary to the existence of that affection. I have met animals affected with exudative pleuro-pneumonia without pulmonary lesions; the liver presents sometimes a plastic infiltration analogous to that of the lung. It is a fact of observation, noted by several experimentors, amongst which are M.M. Delafond, Zundel, and H. Bouley. The latter says: "The virus of peripneumonia can saturate an organism and protect it from further attacks of this disease, without, however, manifesting its presence by the inflammatory disease of the lungs and the plastic transudations belonging to it."

The autopsy of animals which have died from inoculation show the same cadaveric lesions as are found in those which have succumbed to the disease.

"What veterinary surgeons inoculate," says M. Paul Cagny, a young and learned veterinarian, "is peripneumonia with all its virulency; the local symptoms only differ from the disease inoculated naturally, or those from that introduced by the lancet. This is due to the anatomical organization first, and again to the physiological action of the organs at the point of inoculation. It is for that reason that inoculation on the dew-lap had to be abandoned."

These very great alterations cannot be explained but by a deep modification in the constituting elements of the blood which

reacts thus upon the whole organism. These infiltrations of plastic matter in the places where inoculation has been made and where there is abundance of connective tissue, often take so rapidly and abundantly, on the dew-lap for instance, that the animal succumbs soon to them.

That is what was observed in the unfortunate inoculations, imprudently made by M. Cloes, at the castle of Herkenrode, near Hasselt, where almost all the animals inoculated on the dew-lap died. The lesions of the muscles are identical to those of the lungs ; here again it is the interfascicular connective tissue which is the seat of the infiltration.

When one incises these swellings, the quantity of liquid which escapes may be valued at several liters a day. These swellings generally assume extraordinary size, cover large surfaces of tissues and look like hepatized lungs, in which some tissues weigh as much as 20 or 30 kilogrammes.

Exudative pleuro-pneumonia ends ordinarily, whatever is done, in the death of the animal by asphyxia ; the lung, most often the right, and sometimes both, is so much filled with the characteristic exudation that it becomes impermeable. If the patient does not die with asphyxia, the lung being only partly hepatized, the disease hangs on and most of the organs, especially the liver, become infiltrated, the intestines present inflammatory patches, exudations of serosity take place in the splanchnic cavities in the cellular tissue, the muscles become soft, etc., and the animal succumbs after several days of the disease.

Sometimes animals suffer only slightly from the effects of contagion, and recover rapidly ; but at other times, in exceptional cases, the disease ends by the encysting of a part of the lung, which forms a sequestrum, ordinarily very hard, in the middle of the parts of the lung still healthy, and the animal may thus live quite a long time in an apparent state of health. These very curious lesions are found only when the animal is destroyed for consumption.

This phenomena is altogether like that observed by M. Pasteur in chicken cholera. He says : " In the cases of recovery, the parasite is stopped little by little in its development, and disap-

pears at the same time that the muscle hardens and lodges itself in a cavity whose whole surface resembles that of a granulating wound of healthy nature. The necrosed part finishes by forming a sequestrum, so well isolated from the cavity where it is contained that one feels it under the finger, through the skin, in the interior of the muscle, and by the smallest incision can take hold of it with the fingers and extract it.

(*To be continued.*)

EXPERIMENTAL ANALYSIS

OF THE MALIGNANT PUSTULE AND CARBUNCULOUS ŒDEMA; DETERMINATION OF THEIR VARIOUS FORMS AND OF THEIR DEGREES OF VIRULENCY.

By M. COLIN, of Alfort.

Continued from page 366.

Therefore, though everything has seemed identical at first in our two animals, the carbuncular process has changed character at a given time. In remaining localized in one, it has allowed the virulency to die out *in situ*. In spreading in the other, it has extended to the whole of the organism. In the first case, the lymphatic system has remained healthy; in the second, it became affected, and as a mean of connection between the starting point and the rest of the economy.

If we wish to have the material proof of the intervention of the lymphatic glands in the morbid process by which anthrax is generalized and become fatal, let us take again two dogs, I mean two adult sluts: Let us insert on one the virulent liquid in the mammæ, in front of the pubis, near the ganglions, and on the other, on the contrary, in the anterior mammæ between the umbilicus and the abdominal appendage of the sternum, consequently quite far from the inguinal and axillary ganglions. On this one,

the carbuncular tumor will remain small and will subside after the third or fourth day without giving rise to general accident. On the first, the tumor will rapidly develop, assume enormous proportions, be surrounded by large swelling, the prepubic inguinal bubons being very large and very painful. All that by the second day. There will be general intense fever, injection of mucous membranes, the temperature will rise to $41\frac{3}{5}^{\circ}$ to 42° , the general infection will appear imminent. Death may take place the fourth or fifth day, with extensive lesions of the lymphatic system, of the spleen, intestines, &c.

It is on killing animals at different periods of the evolution of our malignant pustule that we have been able to understand, sometimes the boundaries of accidents, sometimes their progressive march or their more or less rapid extension to the whole of the organism. Here is what we have observed:

At the onset, that is, as far as the 12th, 20th, or even the 24th hour after the insertion of the liquid, the phenomena are the same in all cases. The morbid process is purely local; the irritation of the skin and of the tissues does not extend beyond a radius of a few centimeters; the œdema remains circumscribed; the volume or aspect of the lymphatic glands has not changed.

But from the 24th to the 48th hour, the first ganglions nearest to the pustule become diseased; the cellular envelope is infiltrated, their blood vessels dilated, their tissue becomes rosy, then red, by degrees purplish, and sometimes blackish; they swell and have a tendency to break up into pulp, especially in the centre. The first buboes thus formed may, if very near the tumor, mingle with it and with the common œdema.

It is in a successive manner that ganglions become diseased, and as they are on the way of traveling of the virulent elements. After the mammæ and the inguinal, in the case of the pustule being near the posterior mammæ, the pelvis, then the lumbar, thoracic, even the axillary become tumefied in one half of the body, if the pustule does not occupy the median line.

A noticeable time, sometimes even quite long, may transpire between the lesion of the first or fourth ganglion and that of the following. It seems that the first saturate themselves with viru

lent elements before sending them to the following, and that they only give up what they may have received or elaborated in excess. The steps in the arrest which separate the infection of a ganglion from that of another are of variable duration. In being far apart, they seem to constitute one of the principal obstacles to the development of general accidents.

Ganglions do not act alike in all cases of carbunculous tumors. If the pustule is to remain a local accident, they do not take any part in the morbid process; they limitate or circumscribe it. If that pustule is to bring on a general infection, they are successively transformed into bubons, which act the part of internal malignant pustules added to the first; the centers of infection are consequently multiplied in proportion to the number of those organs. There is only one, if the pustule remains isolated; there are three, four, five and more, if anthrax has spread through the whole lymphatic system. Thus we can understand the seriousness of the malignant pustules of the region of the head, of the neck and chest, where ganglions are so numerous.

In the point of view of the pathogeny, the entire evolution of a carbunculous disease proceeding from a malignant pustule comprehends five periods. The first corresponds to the development of the pustule, the second as a step of arrest, the third corresponds to the successive development of bubons and malignant ganglionar pustules, the fourth is another step of arrest, and the fifth is that of a general infection of the blood and of all the organs.

These five steps that anatomical examination allows to distinguish in the evolution of anthrax, are also distinguishable by experimentation for virulency, and indicate and measure them. At first, this property belongs to the tumor only, even limited to the center of the tumor; later it extends to the ganglions, and finally to the mass of the blood. The intervals which separate them may be very long. Virulency is plainly realized in the pustule before showing in the ganglion; it is in this long before it is noticeable in the blood or other parts of the blood. The intervals must not be overlooked, for those are the moments when the disease may limit itself, when virulency may die out.

Thus, when the disease is to remain local, the step of arrest following the evolution of the pustule is that where it may lose its virulency. Sometimes, as I will demonstrate later, the virulency already developed to a certain degree in a ganglion, dies out in that organ before the time when it might have appeared in the blood.

The attentive study of the malignant pustule of animals apparently refractory to anthrax or little predisposed to it, then proves on one side that this pustule is a complete virulent anthrax, no matter how localized it may be; it proves on the other side that the generalization of this local condition operates, if not exclusively, at least principally through the intermediate of the lymphatic system, as every time this system remains indemn, the disease aborts and is followed by no serious consequences. Of course it is difficult to say why, in cases apparently identical, this system may remain nearly indemn in such subjects, while in others it becomes the seat of deep lesions. Its more or less marked development according to the individuals, its different degrees of susceptibility, do not suffice to explain these differences. What is certain, however, is that in the young age, at the time when the animal enjoys all its activity and strong impressionability, anthrax becomes frequently general as sequelæ of malignant pustule.

It is evident that the lymphatic system, especially its ganglions, plays here an essentially special part. If it was limited to absorb virulent agents, to transport them in the circulation with the lymph, it would already do so, and the material that it carries would rapidly reach its destination. In conclusion, let us remark that in all cases of carbunculous tumors or malignant pustules without lesions of the lymphatic glands, the virulency of the tumor dies out quickly, and general infection is prevented. This fact of the spontaneous extinction of virulency, far from being exceptional in dogs and the other animals which take anthrax with difficulty, becomes the rule; for in adult age it may be seen nineteen times out of twenty. The bacteridie, though disseminated in the canal of the tumor, in its tissues and blood vessels, in the surrounding oedema, dies there, and dies whether the irritation

be slight or severe, whether or no there is serous exudation, suppuration, ulceration, gangrene. This bacteridie or its germs, which, it is said, are preserved, even cultivated and grow in the cadaver, in putrified matters, dry or damp, for long years, die or are destroyed in a few days in the best carbunculous tumor, the richest in cellular tissue and blood-vessels, and the most impregnated of lymph or extravasated serosity. Indeed, all the pustules without fatal sequelæ that I have examined from the beginning to the end, had lost virulency and bacteridies from the fifth and sixth day; sometimes sooner. From this time neither the liquid from the canal or from the phlyctens, nor the pus, serosity or blood obtained by scarifications, nor the slough of the escharre diluted in water, have produced anthrax either in the rabbit or Guinea pig. The essay of these products has been carried out as far as the twelfth or fifteenth day, always with negative results.

To judge of the value of the objections which would consist in saying: the bacteridie is not destroyed in the tumor, it is carried off by the circulation—I have looked for it in the remains of the infiltrations, in the spleen, the ganglions, the liquid of the thoracic duct, the blood, and even in some of the products of secretion, and that specially by the method of inoculation; those always remained sterile.

It does not belong to me here to inquire why this ærobie being lives, or seems to live, in a tumor closed for several days, dies there, or disappear after the dehiscence of that tumor; why its disappearance corresponds exactly with the work of resolution or serous exudation, of suppuration, of the slough of the eschar. For the present, I can only state facts.

To resume, animals known as refractory to anthrax contract malignant pustule, very well with or without œdema. This pustule or tumor takes many various forms, according to the points of the body where it develops itself. It aborts in parts where the skin is thick, and the cellular tissue dense; it grows, on the contrary, with rapidity and assumes enormous proportions where the skin is thin, rich in lymphatics, in the neighborhood of ganglions, especially in the groin and on the mammæ; it is most often complete from the twenty-fourth to the forty-eighth hour.

In all cases, without exception, the tumor is virulent; by the serosity of its canal, its blood, its extravasated liquids as by its œdema. This virulency lasts several days and gradually dies out, from the seventy-second to the eightieth hour, even often from the forty-eighth.

The pustule disappears either by simple resolution, without opening, or after having serosity oozing out, in giving a dry eschar, in suppurating or ulcerating extensively. It moves spontaneously with any one of these modes of transmission in nine-tenths of the cases of the adult subjects.

Every time that the carbunculous tumor is accompanied with extensive lesions in the lymphatic ganglions, it has a tendency to produce a general state which often becomes fatal, especially in young animals.

In the point of view of the diagnosis, microscopic examination of the elements and products of the tumor is far from furnishing positive characters; for the tumor, of surely carbunculous nature, may not show any bacteridie in several of its products or layers, and the inoculation of those may remain sterile. And again, the virulency being ephemorous in the tumors that do not kill, it weakens and disappears without appreciable cause before the moment of resolution, of ulceration or any other mode of transmission.

Considering the prognosis, the physical and microscopical characters of the tumors leave also the observer in doubt. The small tumor, with slow growth, which gives no anxiety, brings on general accidents and death as well as the most voluminous tumor, grown with rapidity.

I conclude in giving as proofs and explanations, two tables, one indicating, in chronological order, the animals of canine and feline species upon which inoculations have developed accidents, followed by recovery or death; the other showing the animals where inoculation remains sterile:

The experiments of these tables are 153 in number. The mortality has been only of 23 in 153, or 14 per cent., though there has not been any treatment; 130 remained sterile. In 62 cases

accidents followed, and in 23 these were fatal, especially in young subjects.

In 91 cases carbunculous inoculations remained sterile. In deducting the young subjects, the mortality remains about 5 per cent.

EDITORIAL.

What action will the United States take in relation to contagious diseases of domestic animals, when the new Administration come to power?

What will the Legislatures do in those of our States where the diseases are prevailing more or less; and, specially in those which are infected with pleuro-pneumonia?

These questions are of no small importance, and while they will be of great influence in those parts of the world where our cattle trade is of paramount value, will at the same time be of no less vital interest and be anxiously looked for by our people.

That the United States are not ignorant of the greatness of the subject is manifestly evident by the partially successful attempts made two years ago in some of the eastern States, and also by the investigations made by the Department of Agriculture at Washington, through its special agent, Mr. C. P. Lyman, who has sent his report, and if we are to believe the extracts made from it by some newspaper correspondents, is reported to have given to understand that pleuro-pneumonia exists in our western States, as from extracts which we read in those papers he is said to have written that, "we have this dreaded cattle scourge established amongst our western herds, that Chicago, Buffalo, Albany, Boston and Portland, are diseased centres." * * * (†)

The fearful importance of that statement cannot be measured, and while we do not believe in the correctness of the idea thus advanced by our esteemed friend, a disbelief which in us is not only strengthened by all that we have heard and read on the matter in

† N. Y. Times, Dec. 14, 1880.

western papers, but which the doctor denies entirely, we cannot avoid thinking how much more difficult the task of getting rid of the disease would be if the report is correct—indeed, would it be possible then to stamp out this fearful disease?

We have been told again and again that the eastern States, and few of them at that, were the infected ones, and now this limited ground is made to spread to our western markets!! Where do the diseased cattle come from? Where does the extent of the disease stop?

Will the problem of eradicating the disease by stamping out be attempted? or will other means be recommended so as to annihilate the disastrous effects of the disease?

Will the General Government establish the Veterinary Sanitary Department, which has so often been recommended by veterinarians as well as by those interested in agricultural pursuits and investigations?

Will the respective States make other attempts, and appropriate funds for the carrying out of measures which would have most probably proved successful had they not been suddenly stopped on account of lack of funds to be placed in the hands of Boards of Health, whose labors is to say the least useless?

Can the question of State rights be overlooked and general legislation be created by which one and all States will be submitted to similar sanitary laws? Why not. If the National Board of Health has succeeded in organizing their work, why would a Veterinary Sanitary Board be less successful?

And again, if such organization or bureau was created, under what department would it be placed?

All these are questions the solution of which all people interested in cattle trade, are anxiously looking for, and to which no veterinarian in the country will remain indifferent, if he fully realizes the importance of the part he will have to fulfil when the laws which will solve these problems will have to be executed.

THE veterinary profession of England is already heavily indebted to Mr. George Fleming for the immense amount of good

work he has done in its behalf. Not satisfied with the good already realized for veterinary English literature by the numerous works he has written, and which to-day are found in the libraries of every practitioner and in the hands of every veterinary student, nor by the improvement he has obtained in the military veterinary service, he now turns his attention to the position of the civilian veterinarian and wants him to be protected from quackery. A bill is to be introduced in the forthcoming session of Parliament for the protection of the title of Veterinary Surgeon, and no doubt, pushed by Mr. Fleming, and backed by the intelligent wealth of England and by the medical profession, will soon become a law, and then the day of coachmen, grooms, farriers and blacksmiths styling themselves veterinary surgeons will soon be over. How much the United States are in need of similar legislation, our readers know. But when will we be able to announce this great step in the advancement of a science which in this country is yet but in its infancy?

HUMAN AND ANIMAL VARIOLÆ: A STUDY IN COMPARATIVE PATHOLOGY.

BY GEORGE FLEMING, F.R.C.V.S., ARMY VETERINARY INSPECTOR.

(From the Veterinary Journal, London, England.)

(Continued from p. 391).

I have already alluded to the results of small-pox inoculations on the horse, and shown that, as on the ox, they were either negative or nearly so, the positive results yielding only the most trifling evidence of infection, and nothing at all like horse-pox being ever produced from the insertion of the small-pox virus into the skin of the horse, while re-transmission to mankind only gave rise to small-pox. On the contrary, as we have seen, horse-

pox inoculated on the cow produces what in every way corresponds to cow-pox, or on man to vaccinia. From the cow and man horse-pox can be transmitted indefinitely; and while its action is modified by repeated transmissions, its protective influence against variola is undiminished. This has been demonstrated times almost without number, from the days of Jenner up to the present date. The most interesting and instructive of recent demonstrations in this direction is that recorded by Dr. Pingaud, in a communication presented to the Paris Academy of Medicine a few months ago. Having observed, with Drs. Viseux and Thomas, an epizooty of horse-pox in February, 1879, he determined to make some experiments, and selected as a vacciniferous subject a four-years-old horse affected with the disease, but whose antecedents were well known, and whose health at other times was excellent. The cutaneous eruption was discrete; there were only a few crusts of pustules about the hollow of the pasterns; but in the mouth, and within the upper lip, the mucous membrane was studded with vesicles offering the characteristic macerous aspect. Lymph was collected from these pustules with the greatest care, and seven young soldiers of the 10th Hussars, who had not been vaccinated, were inoculated. On the sixth day, six of the men showed at the seat of inoculation the characteristic vaccine vesicles, which had a somewhat inflamed base. From four of the soldiers lymph was taken; with this sixty-four men—eight of whom had not been vaccinated—were inoculated. In forty of these the result was positive—sixty per cent. successful vaccinations. With none of the patients were there any serious inflammatory symptoms, and only in a very small number did the inoculations assume a furunculous aspect. Calves were inoculated from the horse, but the proportion of successes were only 48 per cent., rather going to prove that the virus became weakened in the calves.

On May 5th, 1880, a case of horse-pox was discovered in Paris among the horses of a German horse dealer. A three-months-old heifer was inoculated on May 5th, with matter from this horse, the inoculations being made by three punctures on the udder. The result was a complete success; and from this animal another

heifer was as successfully inoculated on the 13th of the same month. On the 19th there was a very fine vaccinal eruption, no fewer than sixty pustules being developed. Two other heifers were vaccinated from these, and so abundant was the lymph on the consecutive eruption that the Société d'Hygiène was well supplied with material for vaccination purposes. In September of this year also, there was so severe an outbreak of horse-pox among the race-horses at Chantilly, near Paris, that several of them had to be struck off their engagements.

I have stated that horse-pox and cow-pox are almost, if not quite identical in their effects, when transmitted by inoculation to man, the ox, or the horse. Chauveau inoculated five horses and two asses with animal vaccine from Naples; the youngest animal was seven years old, the others from sixteen to twenty years of age. For five and six days there were no signs, but in from five to eight days the seat of puncture became markedly papulous, the papules increasing in size until about the tenth day, when they were acuminate, had a very broad base, and were red, painful and hard. From the ninth to the twelfth day was the period of secretion, the epidermis becoming slightly raised throughout the whole extent of the papule by an exudation of limpid citron-colored serum; this dried into yellowish transparent crusts, very different in appearance from those of vaccinia in man or cow. The secretion from the lymph continued for several days, and ceased from the thirteenth to the seventeenth day. When the crust was removed there appeared a moist granular red surface level with the skin, but having a deep central cavity, a kind of umbilicus, in which had been fixed, like the head of a nail, the prominent under surface of the crust. There was no febrile reaction. In the asses there was shedding of the hair and epidermis in various parts, with abundant serous exudation. As compared with its evolution in man and the cow, the vesicle or pustule was slower, and there was a difference in its shape and character, the pustule being acuminate, the lymph scanty, and the umbilicus small or altogether absent; though in an ass sixteen years old the pustule had from the commencement a central umbilicus. In the horse the crust extends over all the pustule, while in man and

the cow only the centre is covered. In the ox the lymph is rarely abundant, and there is never anything more than a thin brown crust; but in the horse the crust is wide, thick, rough on the surface, transparent and citrine-tinted.

Before leaving the subject of horse-pox, it may be observed that Spinola remarked that the low-lying regions along the Baltic appeared to be more infested with the disease than elsewhere.

SHEEP-POX.

Sheep-pox differs from cow and horse-pox in having a history extending over some centuries, and closely in resembling small-pox in its extension—this depending not only on its contagious but also on its infectious properties—and the eruption being more or less general over the body. Indeed, so far as intensity of virulence is concerned, its appearing in an epizootic form, as well as the serious symptoms and mortality accompanying sheep-pox, there is the closest resemblance between it and human variola. We have seen that cow-pox and horse-pox are far from being serious disorders, the affected animals, in the majority of instances, being very little, if at all, disturbed in health, while the diseases are not infectious, and not always very contagious.*

* Depaul believed horse-pox to be infectious, and cites, in support of his opinion, an instance in which a cow was inoculated with the lymph from the nostril of a horse, when seventeen other cows, inhabiting the same shed, were soon after infected, cow-pox pustules appearing on the udder and teats. In addition, a horse kept in a badly-constructed box in this stable, and breathing the same atmosphere as the cows, was also affected, the eruption showing itself on different parts of its body. It is not at all improbable, however, that the cow-keeper and his assistants, who handled the diseased and healthy animals alike, were the chief agents in spreading the malady. Indeed, the wife of the cow-keeper, in milking the cows, was vaccinated on one of her fingers, and yet continued to handle the teats of the others, notwithstanding the pain she experienced. Bouley has had perfectly healthy horses and cows cohabit with diseased horses, and when the malady was produced in them he was always able to trace it to direct contact. During the epizooty at Alfort, in 1863, it was possible to transmit the horse-pox to a series of horses by placing them one after another in a stall which had been occupied by a diseased horse. Each animal became affected in turn, and at times its immediate neighbors also; but beyond those in that stable there were no further transmissions, all the other horses remaining unaffected. As Bouley justly remarked, a really infectious disease does not comport itself in this manner. Veterinary Surgeons Turenne and Mathieu have also experimentally demonstrated that horse-pox is not infectious, and this is in accord with my own experience.

In the first portion of this paper, I alluded to sheep-pox being mentioned at the Vaccination Conference, and observed that it was there admitted that the sheep had a variola of its own. On again looking over the report of that meeting, it appears doubtful whether the speaker who referred to it thought it was peculiar to the sheep, or whether it was not also derived from human variola. The best proof that it has no relationship whatever to small-pox, is to be found in the fact that it prevails continuously, and sometimes most extensively and fatally, in countries where small-pox is extremely rare, as in East Prussia; and in regions where the latter is never absent, and is often epidemic, sheep-pox is only known as an imported disease. In England it is never seen unless introduced from countries where it is enzoötic. The terrible outbreak which ravaged our flocks in A.D. 1276, and continued twenty-eight years, was due to importation from France; and the appearance of the disease in 1847 and 1862 was due to foreign sheep. It has been unknown in the country since the latter date.

Notwithstanding the close resemblance of sheep-pox to small-pox (the pustules in the former being, however, acuminate, but the course of the malady is very similar, the complications the same, and the mortality as great), yet the one disease has no influence either in the production of or protection from the other. It appears to be finally established that human variola will no more produce sheep-pox than it will cow-pox, notwithstanding the close affinity between the two; and while variolation will not protect from sheep-pox, neither will inoculation with the virus of the latter prevent mankind having small-pox.

Some authorities have denied that ovine variola can be transmitted to the human species; and the extreme rarity of cases of supposed accidental transmission certainly gives countenance to the opinion. But several instances are recorded, nevertheless, of veterinary surgeons who have been accidentally inoculated with the virus, suffering from local and general disturbance, like that produced by vaccination.* Korner† reports that a child who

* See "Medizin. Jahrbuch des Oesterreich. Staates"; also "Mittheilungen aus der Thierärztlichen Praxis in Preussen," Jahrgang 17; and "Magazin für die gesammte Thierheilkunde," 1873, p. 467.

† "Mittheilungen auf der Thierärztlichen Praxis in Preusschen Staate für 1876-77 und 1877-78."

tended (barefoot) sheep affected with variola, had a number of discrete and confluent pocks on both feet. This transmission occurred also to one of Korner's own children. On the back of the boy was developed a pock, which finally became as large as a five-pfening piece; there was severe concomitant fever. The child appears to have been inoculated while Korner was charging some capillary tubes with sheep-pox lymph from a pipette, a drop of the fluid, it is supposed, having fallen on him.

Röll has unsuccessfully attempted to inoculate cattle with sheep-pox, and sheep with cow-pox; but Zundel* has given an instance in which two cows were directly infected through cohabitation with diseased sheep. Hanbner mentions that inoculation with small-pox matter has sometimes produced pustules on the dog and pig; but reinoculation from these did not cause the malady in sheep. Hertwig and Hering assert that the malady is readily communicated to goats in a true form, and may be transmitted from them to sheep. In the goat the pustules are usually smaller, according to Giesker, and the general disturbance is less marked. But transmission is very far indeed from certain, as goats very often associate with sheep without becoming affected. Hering knew of an instance in which fifty-four goats grazed with diseased sheep, and only ten became sick. According to Kersten, Lenherdt, Spinola, and Gerlach, reciprocal inoculation of goats and sheep is always successful; while according to the observations and experiments of Gasparin, Dominick, Curdt and Spinola, and, still more recently, Gerlach, there appears to be a close identity between the variola of hares and rabbits and that of sheep, inoculations from one species to the other always yielding positive results.

Sheep have a kind of variola known to the Germans as "Steinpocken" or "Aaspocken" (*Variola tubercuosa*, *Varicella ovium*). It has been described by Haxthausen,† Hoftrichter,‡ and Hering.§

* "Journal de Méd. Vétérinaire de Lyon," 1867, p. 185.

† Rust's Magazine, band 29.

‡ Henke's, "Zeitschrift," 1831.

§ "Specielle Pathologie und Merapie für Thierarzte," p. 389.

When vaccination as a protection from small-pox began to gain ground, as its benefits were becoming more and more evident, many of the leading veterinarians on the Continent tried it as a protective against sheep-pox; but they soon discovered that vaccinated sheep were as susceptible to their own particular variola as the unvaccinated. Verrier, Goher, Husson, Voison, and other veterinary surgeons, found that, no matter how successful the vaccinations had apparently been, the sheep took the disease, either accidentally or experimentally, as readily as before. For this reason vaccination is never attempted now, as it does not confer immunity from sheep-pox—a curious circumstance with regard to inter-variolization among different species of animals.

The contagium of sheep-pox is very active, as has been already stated. The observations and calculations of Chauveau with regard to the infectiousness of the malady, compared with that of vaccinia, tend to prove that animals attacked with sheep-pox will infect a hundred times more readily than those affected with cow-pox. The sheep-pox lymph also, according to the same authority, contains in an equal volume and weight a much more considerable number of virulent corpuscles, and is much more potent than that of vaccinia. He has shown that if the latter is diluted with fifty times its weight of water, inoculation with it is uncertain in its result, while the sheep-pox matter may be diluted with 1500 times its volume of water before it is reduced to the same condition. He has also demonstrated that the activity of this matter, like that of every other virulent substance, resides in the solid particles or elementary corpuscles held in suspension in the serum, which is not viruliferous; and that an equal quantity of sheep-pox lymph contains thirty times more of these particles than that of vaccinia.

It may be remarked that in Australia, New Zealand, and the American Continent, sheep-pox has never been seen, because it has not been carried there. Yet human small-pox, imported from the western world, is as prevalent in those regions as with us. This should be convincing proof that there is no relationship between the two variolæ, so far at least as their contagious principles are concerned.

(To be continued.)

HONORARY ASSOCIATES OF THE ROYAL COLLEGE OF VETERINARY SURGEONS. (*)

The following is the list of Honorary Foreign Associates elected by the Council of the Royal College of Veterinary Surgeons, on the nomination of the President, at the quarterly meeting held on October 13th. We regret that there is not space to insert their claims to this high distinction, but their names will be familiar to many of our readers:—

FRANCE.

Henri Bouley, Inspector of the French Veterinary Schools, ex-President of the Paris Academy of Medicine and Professor of Physiology at the Sorbonne.

A. Chauveau, Doctor of Medicine, Director of the Lyons Veterinary School, Professor of Comparative Pathology at the Lyons University.

F. Saint-Cyr, Professor at the Lyons Veterinary School.

C. Baillet, Director of the Toulouse Veterinary School.

M. Toussaint, Doctor of Medicine, Professor of Physiology at the Toulouse University and Veterinary School.

A. Goubaux, Director of the Alfort Veterinary School.

G. Colin, Professor of Physiology at the Alfort Veterinary School.

E. Decroix, Principal Veterinary Surgeon to the French army.

P. Megnin, Laureate of the Institute of France, Army Veterinary Surgeon.

GERMANY.

F. Roloff, Doctor of Medicine, Director of the Berlin Veterinary School.

C. F. Mueller, Professor at the Berlin Veterinary School.

* From the Veterinary Journal.

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- J. W. Schutz*, Doctor of Medicine and Professor at the Berlin Veterinary School.
- W. Dieckerhoff*, Professor at the Berlin Veterinary School.
- C. H. Hertwig*, Doctor of Medicine, ex-Professor at the Berlin Veterinary School.
- E. F. Gurlt*, Doctor of Medicine, ex-Professor at the Berlin Veterinary School.
- K. Gunther*, Director of the Hanover Veterinary School.
- C. Harms*, Doctor of Medicine, Professor at the Hanover Veterinary School.
- L. Franck*, Director of the Munich Veterinary School.
- O. Bollinger*, Doctor of Medicine, Professor at the Munich Veterinary School and University.
- E. Hering*, Doctor of Medicine, late Director of the Stuttgart Veterinary School.
- W. Fricker*, Director of the Stuttgart Veterinary School.
- F. A. Zürn*, Doctor of Medicine, Professor of Veterinary Medicine at the University of Leipzig.
- G. C. Haubner*, Doctor of Medicine, Director of the Dresden Veterinary School.
- A. O. Leisering*, Doctor of Medicine, Professor at the Dresden Veterinary School.
- A. G. Siedamgrotzky*, Doctor of Medicine, Professor at the Dresden Veterinary School.
- J. E. L. Falke*, Doctor of Medicine, Professor at the University of Jena.
- A. Lydtin*, Veterinary Adviser to the Baden Government, Karlsruhe.
- G. Plug*, Doctor of Medicine, Professor of Veterinary Medicine at the University of Giessen.
- H. Putz*, Doctor of Medicine, Professor of Veterinary Medicine at the University of Halle.
- A. Zundel*, Government Veterinary Surgeon at Strasbourg.
- H. Amacker*, Doctor of Medicine, Government Veterinary Surgeon, Dusseldorf.
- T. Adam*, Government Veterinary Surgeon, Augsburg.
- C. F. Heusinger*, Doctor of Medicine, Erlangen.

AUSTRIA.

- F. M. Roll*, Doctor of Medicine, late Director of the Vienna Veterinary School.
- F. Mueller*, Doctor of Medicine, Director of the Vienna Veterinary School.
- O. Bruckmuller*, Doctor of Medicine, Professor at the Vienna Veterinary School.
- L. Forster*, Doctor of Medicine, Professor at the Vienna Veterinary School.
- Tormay Adalbert*, Director of the Veterinary School at Budapesth.

BELGIUM.

- A. Thiernesse*, Director of the Brussels Veterinary School.
- J. M. Wehenkel*, Doctor of Medicine, Professor at the Brussels Veterinary School and University.
- M. Laho*, Professor at the Brussels Veterinary School.
- A. Degive*, Professor at the Brussels Veterinary School.
- E. Dele*, Government Veterinary Surgeon at Antwerp.

ITALY.

- J. B. Ercolani*, Count, Doctor of Medicine, Director of the Veterinary School at the Bologna University.
- N. Lanzillotti-Buonsanti*, Doctor of Medicine, Director of the Milan Veterinary School.
- E. Perroncito*, Doctor of Medicine, Professor at the Milan Veterinary School.
- M. Guzzoni*, Doctor of Medicine, Professor at the Florence Veterinary School.
- D. Vallada*, Director at the Turin Veterinary School.
- R. Bassi*, Professor at the Turin Veterinary School.
- S. Rivolta*, Doctor of Medicine, Professor at the University of Pisa.
- S. Oreste*, Director of the Naples Veterinary School.
- A. De Silvestri*, Professor at the Turin Veterinary School.
- J. Generali*, Director of the Modena Veterinary School.

P. Delpratò, Director of the Veterinary School at the University of Parma.

HOLLAND.

A. W. H. Wirtz, Director of the Veterinary School at Utrecht.
T. C. Heckmeyer, Professor at the Utrecht Veterinary School.

SWITZERLAND.

R. Zannger, Doctor of Medicine, Director of the Zurich Veterinary School.
V. Nierderhausern, Director of the Berne Veterinary School.

RUSSIA.

P. Seifmann, Director of the Kasan Veterinary School.
F. Unterberger, Director of the Dorpat Veterinary School.
E. Semmer, Professor at the Dorpat Veterinary School.
H. Schmoulewitsch, Veterinary Adviser to the Minister of the Interior at St. Petersburg.

DENMARK.

H. Krabbe, Doctor of Medicine, Professor at the Copenhagen Veterinary School.

SWEDEN AND NORWAY.

N. E. Forssell, Director of the Veterinary School at Skara.
J. G. H. Kinberg, Doctor of Medicine, Director of the Veterinary School at Stockholm.
C. Lindquist, Professor at the Stockholm Veterinary School.

UNITED STATES OF AMERICA.

A. Liautard, Doctor of Medicine, Director of the American Veterinary College, New York.

SOCIETY MEETINGS.

MONTREAL VETERINARY MEDICAL ASSOCIATION.

This Association held its regular fortnightly meeting in the lecture room of the Veterinary College on Thursday evening last, the President, Mr. C. J. Alloway, V.S., in the chair. A full attendance of members was present. The Secretary stated to the meeting that a number of new books had recently been added to the library, which now amounts to upwards of 300 volumes, and that new catalogues were in course of preparation, and would be ready for distribution at next meeting, after the usual routine business had been disposed of. The Chairman called upon Mr. Donald Campbell to read his communication of a case of *Enteritis*, which he interestingly described, and was followed by a lively discussion.

Dr. William McEachran then favored the meeting by reading an exhaustive paper on "Anthrax," a very fatal disease, and known also by different names, such as—splenis apoplexy, carbuncular fever, charbon, &c. The reader treated the subject very fully, and, after alluding to the fatality of the disease, and the danger of communicability by inoculation, to man, urged upon the members the necessity of using the greatest caution in handling animals who have died suddenly, and more particularly in performing autopsies. He illustrated this point by reading records of two cases of accidental inoculation occurring in this city, one of which proved fatal. After a vote of thanks to the essayists, the meeting closed. At the next meeting, December 9th, Mr. M. C. Baker, V.S., will read a paper, and Mr. B. D. Pierce will communicate a case.

STATISTICS OF CONTAGIOUS DISEASES OF ANIMALS IN THE DEPARTMENT OF THE SEINE, (FRANCE.)

BY C. LEBLANC.

HYDROPHOBIA.

In 1876, during the twelve months of the year, 301 cases were reported, amongst which 33 were presented to the Alfort school. They are classified as follows:

274 dogs, 32 sluts, 5 cats. 209 had raving, 102 dumb rabies; 45 persons were bitten.

In 1877, there were 378 cases—339 dogs, 39 sluts. 302 furious, 76 dumb rabies; 62 persons bitten.

In 1878, 613 cases are recorded, of which 441 were in Paris and 70 in the suburbs. Amongst these were 440 dogs, 68 sluts, 3 cats; 390 having raving, 121 dumb rabies; 103 human beings were bitten—67 adults, 36 children—24 deaths amongst these.

In 1879, there were only 285 cases, viz: 249 dogs, 34 sluts, 2 cats. 67 persons were bitten, 12 deaths following.

GLANDERS.

In 1876, there were 189 cases recorded, viz: 72 in Paris, 14 in the suburbs, and 103 in different horse establishments.

In 1877, 134 cases, divided into 72 from Paris, 14 from the surroundings, 147 from the horse companies.

In 1878, 206 cases are recorded in the companies, 28 in Paris, 7 in the surroundings; a total of 241.

In 1879, there were 279, viz: 174 from the horse companies, 75 from Paris, the remaining 30 from the suburbs.

PLEURO-PNEUMONIA.

In 1878, there were examined 267 cases, 43 in oxen, 224 in cows.

In 1879, 210 cases were found, 46 in oxen, 146 in cows.—*Archives Vétérinaires.*

IN MEMORIAM.

At a meeting of the Medical Association of the American Veterinary College, the deaths of E. R. Wing, D.V.S., and of A. D. Carman, D.V.S., were announced and a committee appointed to draft resolutions. This committee subsequently reported and the Society adopted the following :

Whereas, It has pleased Almighty God to remove from us our associate and brother, Augustus D. Carman, who during his college course, won the esteem and respect of his associates, and since then has proven his ability and worth in the zealous pursuit of his profession. Therefore be it

Resolved, That we recognize the hand of Divine Providence, who saw fit to remove our brother after a severe and protracted illness.

Resolved, That we extend to his widow and sorrowing family our heartfelt sympathy in their bereavement.

Resolved, That a copy of these resolutions be sent to his family, that they be published in the Brooklyn *Eagle* and the AMERICAN VETERINARY REVIEW.

Signed, S. M. WALTON, }
 D. J. DIXON, } Committee.
 MADISON BUNKER, }

Whereas, God in his infinite wisdom has seen fit to remove from among us our friend and brother, Edgar R. Wing, who during his college course endeared himself to a large circle of acquaintances, and since then has won the respect and esteem of the members of his chosen profession, in the pursuit of which he met his untimely death. Therefore, be it

Resolved, That we the members of this Association recognize the hand of an allwise Father, in his sudden death ; while at the same time we deeply and sincerely mourn his loss, and that one so zealous in his work should be cut off in the beginning of his usefulness.

Resolved, That we extend our heartfelt sympathy to his bereaved family in their sorrow, knowing however much we may feel the loss, theirs must be infinitely greater.

Resolved, That a copy of this memorial be sent to the family of the deceased, that it be published in the Needham papers and in the AMERICAN VETERINARY REVIEW.

S. M. WALTON, }
D. J. DIXON, } Committee.
MADISON BUNKER, }

EXCHANGES, ETC., RECEIVED.

FOREIGN EXCHANGES.—Veterinary Journal, Veterinarian, Recueil de Medecine Veterinaire, Archives Vétérinaires, Journal de Zootechnie, Revue d'Hygiene, Clinica Veterinaria, Revue fur Thierheilkunde und Thierzucht, Gazette Medicale, Annales de Belgique.

HOME EXCHANGES.—Trnf, Field and Farm, American Scientific, Medical Record, National Live Stock Journal, Prairie Farmer, Country Gentleman, Surgical Reporter, Boston Cultivator, American Agriculturist.

PAMPHLET.—La Distomatose, by A. Zundel.

COMMUNICATIONS.—J. Penniman, N. Lanzillotti Buonsanti, Director of the Veterinary School of Milan.

AMERICAN VETERINARY REVIEW,

FEBRUARY, 1881.

ORIGINAL ARTICLES.

CASTRATION OF THE COW.

PAPER READ BEFORE THE NEW YORK STATE VETERINARY SOCIETY.

BY HUBERT T. FOOTE, D.V.S.

(Continued from page 416.)

At a cattle ranch in Wyoming Territory, I practiced ovariectomy on 169 head of cows this past summer.

On the 9th of July I operated on 31 head. This day was bright and clear, temperature over 90° F., and certainly all that could be desired.

Some 35 head of cows which were as nearly dry as could be found, the youngest 18 months old, and the most of them being in the neighborhood of 10 years of age, after being selected from a large herd that had been gathered in the morning, were driven into a corral, or inclosure for holding cattle. I found that the cows under two years of age, numbering four, could not be operated upon, on account of their vagina being too small to admit of the passage of one's hand; they were, therefore, dismissed.

From the corral, some half a dozen of the remaining 31 cows were driven into a chute, (a narrow alley about 18 inches wide at the bottom, and wider above, for the free passage of the animal,) where each received a rectal injection of warm water. After waiting some 15 minutes for them to evacuate their bowels, during which time only two did so and they only partially, each was bound by ropes, and I began operating, first however causing them to expel the injected water, by mechanically starting it with my hand. Let it suffice to say, that the rectal injection of water for the purpose of emptying the bowels was a failure, and I used it in none of my succeeding operations.

The cows, by the time I began operating, had become pretty well excited from having quite a drive in being gathered, and considerable running in being "cut" out from the herd. All, with the exception of one, I think, were with calf, and two, I should judge, were in about the seventh month of gestation. I did not favor operating on pregnant cows, but as it was almost impossible to find any that were not so, I had no alternative.

I met with considerable difficulty in operating on this lot of animals, as they were insecurely bound, and had been maddened by severe clubbing which they had received at the time of binding, so that they struggled in most cases considerably; besides often by compressing their abdomen or trying to lie down, which threw the weight of their hind parts upon a bar placed under the abdomen to keep them from doing so, they would press the internal viscera back into the pelvic cavity. However, I spayed them at the rate of about four an hour, failing to accomplish my object in the two which were so heavy in calf, in these, being able to reach only one ovary; the other on the same side as the cornua in which the calf lay, having been drawn so far forward by the weight of the fœtus, was beyond my reach. In both of these cases I predicted death. After finishing the work, the cows were driven about a mile in all to water and then to pasture. In driving them they seemed to walk a little stiff, with their tails elevated, only one showing any signs of colic and she only slightly.

They all drank well and when liberated in the pasture they immediately went to grazing, having had no water or food since

early morning. Each day they were driven about a third of a mile to water, and after keeping them there a few hours were returned to pasture. Only one of this 31 head of cows died. She was one of the two which were heavy with calf. The foetal membranes protruded from the vulva on the day after the operation, but the cow seemed to be in no very great distress. On the morning of the second day, I found a live calf at her side, which, judging from its development, had been carried a little over seven months. The cow that day was suffering considerably, and we were unable to take her again to water. She was found dead on the fourth day succeeding the operation, and was immediately opened. The post-mortem showed very violent inflammation to have occurred throughout the peritoneal membrane, the most dependent portion of which was gangrenous and much thickened by false membranous attachments. The peritoneal cavity contained about five buckets of watery serous effusion without signs of blood. The uterus was highly inflamed and still contained most of the placenta, a small part of which protruded from the vulva. The points of the broad ligament from which the ovaries were detached were included in the general inflammation affecting the peritoneal membrane, but were not gangrenous, and the wound in the vaginal wall had cicatrized. The stomachs and intestines were filled with feed, and the rectum was full of hard nodulated fœces. The chest contained no serum, and the organs there were apparently healthy. The remaining thirty cows were held twelve days and then liberated. None of them, as far as I could discover, had aborted. However, as the grass was very long in many parts of the meadow, abortion might have occurred and passed unnoticed. The symptoms following the operation I will describe later.

Encouraged by the results obtained from the operations on this small number, the parties for whom I was making these experiments desired now that I should operate on a large number. I cautioned them that the operation must be done in warm weather, and to have the animals ready for me before the cold weather set in. This they neglected to do, not having them ready for operation before Sept. 6th.

On that date I operated on 24 head of cows. The weather was cloudy and cold, the thermometer ranging about 55° F.

Sept. 7th, 48 more were subjected to the operation. The weather on this day was colder, if anything, than on the previous day.

Sept. 8th I operated on 48 head more, the day being clearer than the preceding two, but the temperature was about the same.

Sept. 9th I operated on 18 head, making in all 138 cows for these four days. The weather was clear and slightly warmer than on any previous day.

These cows were with few exceptions pregnant, most of them in the first or second month, one being in about the fourth month, and all, excepting two, had sucking calves running at their sides.

The results of the series of operations were by no means as satisfactory as those of the former experiment.

Of those operated on the first day twelve died, making half of the total number; eleven died of the 48 operated upon on the second day; nine of the 48 of the third day, and three of the 18 head upon which I operated on the fourth day. This made 35 head in all, that died.

Of these 21 died with gangrene of the peritoneum, with more or less serous effusion into the abdominal cavity. The inflammation in most cases extended throughout the peritoneal membranes even affecting the visceral layer as well.

The gangrene was generally found in the most dependent portions, and in these parts as a rule, the membrane was much thickened by the attachment of false membrane, and what appeared to be a coaguable reddish albuminous infiltration into its tissue, in many cases reaching the thickness of from $1\frac{1}{2}$ to 2 inches. Where the inflammation was extensively diffused and extended to the vagina, the incision in the upper wall of that organ had not cicatrized. If it had not reached as far, the cicatrization was generally in progress, if not complete. In very few of these cases was the broad ligament, from whence the ovary was taken, gangrenous, and in none of the cases could I see any indications of the inflammation in that part having been the cause of the fatal lesions. In these cases no blood-clots were found in the peritoneal cavity.

It is quite probable that some of these cows died from dispnœa, due to the extensive watery effusion which distended the abdomen of many.

I found seven cases with blood-clots in the abdominal cavity. Of these, three only contained very small clots, which probably were not sufficient to cause a fatal peritonitis. However, the peritoneum was gangrenous in two of the cases, and no doubt this condition was the cause of death. In the third, I am satisfied, having seen the animal die, and observed the amount of serum afterwards found in the abdomen, that dispnœa was the cause of death.

In the remaining four cases was found a widely diffused mass of clotted blood extending all over the lower portion of the abdomen, and strung out to the ovarian cord of one side in two of the cases, and to both of the cords in the other two. Of course these immense clots caused a violent peritonitis, resulting in gangrene. Here hæmorrhage was the primary cause. Three of the remaining cases showed no signs of violent peritonitis, but the uterus in each was highly inflamed and its walls gangrenous. They had all aborted, with apparently pretty well advanced fœtuses, although not beyond the fourth month. The ascites in these cases was slight, and the points from which the ovaries had been taken seemed to have been doing well.

The last four of the thirty-five fatal cases were found in the river which surrounded an island on which the cows were herded. As it was impracticable to open them, the cause of death could not be determined, but my belief is that they went into the water to drink, and in endeavoring to climb the banks, which were four or five feet high, were drowned. I opened the thoracic cavity of several of the cadavers, but found no abnormal lesions there. The stomach and bowels were invariably filled with food, and the rectum contained large quantities of hard, dry, impacted fœces.

Of those cows in which I found gangrenous peritonitis without blood-clots, two died on the second day after operating, three on the third, three on the fourth, six on the fifth, three on the sixth, two on the seventh, one on the eighth, and one on the ninth day, making in all twenty-one. Of those that presented

blood clots in the abdomen, two died on the second day after the operation, one on the third, two on the fourth, one on the fifth, and one on the sixth day, making in all seven. The three in which gangrene of the uterus was found, died on the sixth day after operating. As regards those that were found in the river, it makes little difference as to the days, excepting that none were lost in that manner until the third day after the operation.

This was a large mortality, but I think I am able to account for it. These cows were gathered from a distance of seventy-five miles or over, to the ranch, so, many of them had traveled a long distance, of course only in short stages, each day going about ten or twelve miles, but the last day they were driven twenty-five miles, only getting a nip of feed here and there, and on arriving at the ranch were corralled, going all night without food. For the next three or four days they were driven about considerably, getting only little feed and rest; at the same time their calves were branded. This always excites them. These animals are perfectly wild and all handling is done by force. By the time they were ready for operation, their physical condition was run down, and they were excited and feverish. While I was operating on the first day the rest of the cows were grazed and rested, and as the temperature moderated somewhat towards the last, the mortality decreased. The nights succeeding the operations were very severe, blowing a gale and storming the first two, while the last two were scarcely more favorable, excepting that the wind was not so strong. Then again, with only two exceptions, the cows all had calves, which worried them greatly by incessantly sucking and butting at the mammæ, when there could be little or no milk had. The operations were carried on more quickly and smoothly than with the previous lot, passing the animals at the rate of about eight per hour, one reason being that I had had more practice, and another that they were secured more quickly and firmly by means of an apparatus that a cattle owner in Cheyenne had used, having experimented somewhat extensively in the operation through the flank on his own cows. It consisted in a lever working against one side of the chute. It swung on a pivot at the bottom, and glided between two stanchions above. As the cow

would run through the chute, on reaching the lever, and passing her head beyond it, a man with a rope attached to its free extremity would pull it over, grasping the neck of the cow, pressing it against the side of the chute, and so tightly that she could neither pull her head back, or shove forward to any extent. Then, by placing a bar under her abdomen to keep her from lying down, the animal was ready for the operation. Of course she had some slight lateral freedom with her hind parts, but that was unobjectionable. No precaution was taken to keep the cows from kicking me, and only one attempted to do so. Nearly all of them fought pretty hard before we could get them into the lever, consequently receiving a beating in proportion, and with uncalled-for brutality from the ranchmen, many of them suffering the loss of one or both horns, causing them intense pain as they would afterwards manifest. All this, no doubt, added sensibly to the reactional fever, and I noticed that nearly every cow that lost a horn died. During the operations the cows showed no signs of pain or distress until the ovaries were being crushed off, when many of them would arch their backs and flinch slightly, not enough however to evince any acute suffering. After the ovaries were extracted, and before each cow was liberated, she had to be branded with a red hot iron, for the purpose of distinguishing her from the non-castrated cows. When the iron was applied they would often thrash around violently, showing this to be another of the tortures which they had to endure. After being operated upon they were driven about a mile, to a large island in the North Platte River. The pasture was too small to accommodate all, and this was the only means afforded of holding them excepting herding in the day, and corralling at night, which always gives them more or less excitement. To get them to this island they had to wade through water up to their abdomens, and climb a steep embankment about five or six feet high. On the way there they showed no unnatural symptoms with the exceptions of most of them carrying the tail elevated, and a very few showed stiffness in the hind limbs. They drank freely in crossing the water to the island, and immediately went to grazing on reaching it. The symptoms following the operation, are a flexing of the vertebral

column; the animals switch their tails and sometimes have light colics, but these are of short duration. If they cease to eat, drink or ruminate at all, it is only for a short time, and in two or three days they are to all appearances perfectly well. The incision in the vagina heals readily by first intention, and in a few days, owing to the contractility of the tissue of the part.

The complications following the operation are:

1st. Hæmorrhage from the ovarian arteries.

2d. Peritonitis.

3d. Abscess in the pelvic cavity.

4th. Return of the rut.

The first of these is always to be dreaded. I attribute the cause of it, in the four cases which showed extensive blood-clots, to an alteration in the ovarian blood vessels and ligaments. In very old cows such as these were, there is sometimes an excessive friability of these organs, which, predisposed to break easily, are in the worst condition possible to submit to the crushing of the *écraseur*, and thus exposes the blood vessels to hæmorrhage, which always results seriously. I noticed a great difference in the amount of force required in crushing off the ovaries in different animals, the attachments being the strongest in the middle aged cows, and being very weak in some of the oldest. If in these cases hæmorrhage is expected the arteries should be ligatured at the time of operating. When the hæmorrhage cannot be accounted for by some abnormal condition of the cord, it is probably due to improper use of the *écraseur*. From the lesions found in the other three cows, in which there were slight blood-clots, it is to be inferred that small hæmorrhages are not dangerous. It is probable that in these cases the loss of blood in the animals was due to their having been in rut at the time of operating. During the period of rut the ovaries are highly congested and in consequence predisposed to hæmorrhage.

The peritonitis is the most frequent and serious of the consequences. As its causes, we may enumerate hæmorrhage from the ovarian arteries, exposure of the animal to cold and damp weather, predisposition of the subject, abortion, and lastly the introduction into the abdominal cavity of air far below the temperature to which

the abdominal viscera have ever before been exposed. During the operation the air rushes in and out of the abdomen through the vagina and the incision through its walls, and, at a temperature below 60° F., as it was on the days on which I operated, it must necessarily set up an intense congestion, which rapidly progresses into inflammation. The extensiveness of the peritonitis in nearly all the cadavers that I opened, attacking at the same time the visceral layer as well as the parietal, indicates the cause to a great degree to have been the chilling of this membrane. Most of the cows that died had aborted, but the foetuses were so young that I lay little stress on this fact and consider it to have been a secondary rather than a primary trouble. I do not regard this operation as dangerous on account of pregnancy, if the foetus be not more than three or at most four months *in utero*. It may be difficult to reach the ovaries where the pregnancy is approaching the fourth month, but this may be easily ascertained before operating by feeling for them per rectum. None of these cows were over four months in pregnancy, and there was no trouble in securing the ovaries in any of them, but the tension on the broad ligament always endangers the ovary breaking away too quickly and thus causing hæmorrhage, or, from the strain to the membrane in bringing the ovary to a point where the ecraseur can be applied, setting up a severe peritonitis. Though it was impossible to get any reliable statistics of the number of cows that aborted and at the same time recovered, my opinion is that a very small percentage would cover the cases.

The peritonitis always assumes the acute type, and is very rapid in its progress, as is shown by two cows having died from gangrene of the peritoneum on the second day after the operation, while none of the animals showed any unfavorable symptoms on the first morning after, those that I spayed on the first day looking so well the next morning that I did not expect a loss among them, and was encouraged to continue my operations on the remainder. Most of the cows that died from the peritonitis however, suffered much longer than the above two. The first symptoms are, the sudden cessation of milk, the animal becomes greatly depressed, indifferent to all surroundings, shivers, eats and

drinks mechanically, ceases to ruminate, experiences difficulty in locomotion, and the back is arched. She grinds her teeth, sometimes utters plaintive bellows, the belly becomes much distended and signs of colic are frequent. She paws the ground, lashes her tail, stretches her neck and limbs, frequently looks at her side, remains immobile in the standing position, or lies as much as possible on her side, and when disturbed she rises with great difficulty. The look is fixed, sad and anxious. The hair is bristled and the hide bound. The mammæ are collapsed and have a pale yellow color. The respiration is short, quick and stertorous. The fœces are dry, balled, and not abundant, and their evacuation is accompanied with straining. The cow makes frequent attempts at urination, the urine coming away in small quantities, yellow in color and odorous. In all cases the serous effusion is very abundant, and distends the abdomen enormously in some cases. This symptom was probably exaggerated in my experience from the close proximity of water to the cows, and the liberality with which they partook of it. I, unfortunately, was unable to take the pulse and temperatures of the cows in this condition, for it would have necessitated a hard fight with desperate animals to have accomplished it. Gourdon, in speaking of these symptoms, says the ears, drooping, are alternately hot and cold. The body is hot, and the extremities icy. The pulse is sometimes hard, small and wiry, or at other times is full, unequal and quick. When the evil aggravates itself, the pulse becomes more irregular, intermittent and insensible. I inferred a high temperature from the sunken, feverish aspect of the eyes, but was unable to procure any thermometrical calculations. Just prior to death the eyes are dull, face is shrivelled, mouth dry, sadness augments, groans sometimes are uttered, and delirium sets in, the animal dying in great agony.

During the course of the above symptoms, the animals on which I operated sought the sun as much as possible. During the heat of the day they lay around on the hot, dry sand beds, that spread off from one side of the island, at night seeking such seclusion as they might find amongst the small timber on the island.

Abcess in the pelvic cavity. This is a complication that Charlier speaks of, and one which occurred in one of the last of the cows that died from my operations. The animal without doubt died from peritonitis, but I think this had no connection with the abscess. The size of this tumor was about that of an egg, situated in the recto-vaginal wall. On opening it I found a small amount of pus, which would probably have broken its way to the exterior through the vagina or rectum.

Return of the rut. This has been noticed by some of the French experimenters in rare cases. The return of the heat is with great irregularity, taking place one or many months after the operation, but is not periodic as with the non-castrated cows. It lasts but a very short time, some minutes only, in certain cases, but returns then many times in a day. This condition continues some days, and then disappears. I can find no explanation of the cause of this return of the rut, but it has little or no influence, and so is of no particular importance.

Precautions which are advisable for the most perfect results from the operation. The cow should not be in rut. She had best not be in a state of gestation; if she should be, not to exceed the third month. An animal, while in good health, should be spare rather than plethoric. If she should have a sucking calf, she should be deprived of it some time before the operation, so that she may have overcome her anxiety for it, and be at the same time saved from its annoying company. Before operating on a cow she should be deprived of her last meal to lessen the pressure in the abdomen. She should also be thoroughly milked, if she should not be dry. "Her rectum," says Gourdon, "should be evacuated by an injection of tepid salt water, and her bladder emptied by titilating the urinator meatus, which immediately causes urination." I have already given you my experience in trying to empty the bowels. I did not endeavor to empty the bladder, and found no inconvenience therefrom, excepting in a few cases causing urination while operating, from irritating the meatus.

It is best to operate in a high temperature; not necessarily hot, but certainly not below 70° F. A pure atmosphere is also

essential. Lastly, secure the cow in a position slightly inclined forward, and I think no better apparatus can be adopted than the one I used.

Care to be observed during the operation.—In the first place, oil your hands and arms thoroughly with sweet oil; then pass one hand into the vagina before inserting the speculum, to see that there are no purulent collections within; such are sometimes found, and are generally due to metro-vaginitis. It is necessary in these cases to thoroughly cleanse the vaginal cavity before operating. Before using the instruments see that they are perfectly clean, and after finishing the operation on one cow, if another is to be operated upon, a tub of clean water should be at hand to throw them into. It is very important to avoid getting the least particle of dirt into the peritoneal cavity, where it would probably produce fatal complications. In making the incision, care must be used not to start it too far back; as then there is danger of injuring the rectum, or becoming embarrassed in the lateral ligaments which descend from that organ. Besides, when the incision is well forward, the hemorrhage is very slight, generally not enough to stain one's fingers, while it is always more extensive the further back the wound is made. This applies also to the incision made away from the median line. The further it is to one side, the more extensive is the hemorrhage, and furthermore leaves more danger of the formation of abscesses.

In some cases the peritoneal coat is detached from the middle coat of the vagina, and one fails to incise it with the same stroke that cuts the rest of the vaginal wall. If this occurs, the air enters under the peritoneum, and distends that membrane forward into the abdominal cavity. Considerable difficulty is now experienced in dividing it, the best plan being to invert the hand containing the knife, and endeavoring to sever it with a forward stroke, using great care, however, not to injure any of the organs against which it now lies. A few cases will be met in which one of the ovaries is the seat of cysts of sundry degenerations, of more or less volume. Caution must be observed in these cases not to break the cyst in the abdomen. Gourdon says: "These cysts occur in cows that have been in heat many times without receiv-

ing the bull," or what he calls "Taurelières" (cows that are continually in rut, and take the bull, but are sterile). Sometimes yellow bodies are developed in the substance of one of the ovaries, attaining a size that would readily deceive the operator, who, extirpating one, might think it to be the ovary, and thus fail to complete the operation. It comes away very easily, generally by the pressure of the fingers in grasping the ovary to bring it into the vaginal cavity.

I previously mentioned the degenerated condition of the ovarian cord and ligaments that sometimes occur in old cows, and the precautions to be taken when such is suspected. I must now conclude these observations on the care required during the operation, with a warning of the necessity of extracting the whole of the ovary; for the smallest particle of that organ left attached to the ovarian nerves and vessels is sufficient to regenerate, to a certain extent, the ovary, which will then secrete new ovules and thus render the operation useless.

Cares to be observed after the operation.—Gourdon recommends a moderate diet for two or three days. Commencing with the fourth day, increase the diet gradually, until the former rations are reached. Keep the animals from all drafts and changes of temperature. If at pasture, they must be stabled for ten days following the operation, fed with green food, and given water with the chill taken off. If the weather should be fine, they might be let out for a little while each day, and towards convalescence all day, but returned to the stable at night. Unfortunately, these precautions cannot be practised on the Western cattle ranches.

Much, no doubt, may be done towards saving a cow by the aid of medical treatment, when such is possible, and thus further lower the chances of mortality from the operation.

In conclusion, I would state that I see no reason why ovariectomy cannot be performed on cows in this country with as good results as have attended the operation in France. I consider that my experiments, although carried on under very unfavorable circumstances, and attended with a large mortality as a whole, were, to a certain extent, a success. They certainly proved that, even on our cattle ranches in the west, the operation may be performed

during the hot months of June, July and August, and, though unattended with the best precautions and care, with a very slight mortality following. There is no doubt but that the cows would convalesce much quicker if they were turned out at large after the operation, instead of being herded or pastured where they would have to be driven to water every day.

Amongst the western herds, spaying, practiced on the cows before they become too old, unquestionably would prove a great source of economy to the owners, as the old animals give an inferior quality of offspring, which is certainly not to the interest of cattle raisers constantly endeavoring to better the quality of their stock; and, again, a large number of cows are now allowed to bear calves until they are so old that they are carried off by the severe storms of the winter in that country, while those that are sent to market bring only an inferior price, and supply an inferior meat. From this it is readily seen that there is an enormous loss annually from the non-castration of these ranch cows; for these western herds number in the millions; but from the present meagre statistics of cattle in this country, it is impossible to arrive at any approximate figures.

To the farmer the operation would also prove a saving. Such of his cows as are becoming old, by being spayed a year before he intends to dispose of them, would give an increased quantity of milk during the last year, and would bring a higher price when taken to market. It probably would not be to the farmer's advantage to have the operation performed on his young cows for the superior milking qualities derived therefrom, for the calves which the cows in a natural state would annually bring forth, would be of more value to him; unless, of course, he had a ready market for dairy products.

In dairies, the spaying of cows has proved to be of paramount value. Here, the animals giving a largely increased quantity of milk, of superior quality, lasting several years, after which they are of a higher market value, a handsomely increased revenue is afforded to the owners.

In some very carefully figured estimates, compiled by Mons. Charlier about a quarter of a century ago, he showed the annual

loss to the live stock interest in France, from the non-castration of the cows, to amount to over 140 millions of francs, equal to about 28 millions of dollars. The number of cows then butchered annually in that country was about 800,000. This number he divided into the percentages that were Taurelières, and those that were fattened in each of the several different manners, and then estimated the loss on the animals in each class as they dressed at the abattoir. I found it impossible to obtain the necessary figures for a foundation on which to base similar computations in the United States. However, the number of cows in this country is more than double that which France contained at that time, and from some few points that I obtained from a wholesale butcher in this city, the number destroyed annually for meat purposes is in a like ratio increased. This would make about 1,600,000 as a rough estimate of the cow butchery in this country annually. I believe we should not over-estimate the loss from the non-castration of this number of cows if we figured it at double that in France at that time; for, while the difference in the price per hundred-weight for the dressed meat of the castrated and the non-castrated cows (which amounted to about \$1.00 in France,) might be less in this country, (although I hardly believe it would be the case). Our cows average much heavier than the French cows, and, consequently, there would be more meat per head to compute upon. Estimating in this way, the annual loss in the United States from the non-castration of the cows would amount to 56 millions of dollars. To this should be added the loss from the useless wholesale waste of meat from the old cows on the ranches being allowed to die.

To use the words of Gourdon, "This is a real loss without compensation, which weighs at once upon the purse of the cultivator, and the public food, and which diminishes the quality of the meat. This could be avoided by castration, the effects of which would be more decided as the operation would be practiced under conditions more favorable as to age and health."

In New York there is some difference in the price paid by the butcher between the spayed and unspayed cow. Outside of New York, I can find no regular rates of difference. The Chicago

cattle brokers make no variance in the price they pay for cows. If a number of castrated cows in good condition arrive mixed with steers, they are bought in at the same price per pound as the latter, but, if with a lot of natural cows, no distinction is made. Of course this is all wrong, but the castrated cow is not a staple article in the United States market as yet, and until she becomes such, so that the butchers may be able to realize her increased value, there will be no regular rates of exchange for such animals. Furthermore, they can never become a staple article until the educated Veterinarians practice ovariectomy, thus gradually withdrawing it from the hand of the empirics, thereby decreasing the mortality following the operation, and thus illustrating to the agricultural world what practical benefits may be derived from its universal introduction.

NEW RESEARCHES UPON PLEURO-PNEUMONIA AND ITS PREVENTIVE INOCULATION.

BY DR. WILLEMS.

(Continued from page 422.)

III.

Can pleuro-pneumonia when inoculated be communicated to non-inoculated animals kept in the same sheds?

The answer must be negative. This disease is transmissible only by contagion, by inoculation of pathological products, and by re-inoculation.

I have successfully practiced re-inoculation with secondary virus. The official commissions of the Netherlands and many other operators have done the same.

Mr. Lenglen, of Arras, reported that he had inoculated 1,000 subjects with secondary virus, obtained by an incision at the tail of an inoculated animal, and he adds—"To-day I used a virus of the twenty-fifth generation, which has lost none of its protective virtue."

It is well to bear in mind that the inoculated disease is transmissible to healthy animals only by re-inoculation, as many farmers and cattle keepers are afraid to keep inoculated and healthy animals together.

In non-infected stables where inoculation is performed, the cattle will remain perfectly healthy until a new contaminated subject is introduced. Then only non-inoculated animals become generally diseased, while the inoculated resist the contagion. This is invariable, and can be observed wherever the opportunity occurs.

According to the experiments of Prof. Simonds of London, and of Henry Bouley, it would appear that the virus of pleuro-pneumonia remains, so to speak, fixed in the tissues of the animal, and does not become diffused in the surrounding air.

M. Bouley says—"Experiments were begun in the Royal Veterinary College of London in 1870, and continued at intervals till the end of 1874. During the investigations, several means of mediate infections were tried. An animal was exposed to the vapors of the diseased lungs of a cow which had just been destroyed and which had been placed immediately under her nose, in such a way that they had to pass into the respiratory organs at each inspiration. No positive result was obtained."

"In another case, a sponge which had been kept in the nose of a pleuro-pneumonic cow, was placed in the nostrils of a healthy animal and kept there for half an hour. The results remained also negative.

"Then," adds Mr. Bouley, "there must be some reserve made in regard to the various ways in which contagion may follow, and it is to experimentation specially that one must look to enlighten our practice as to the *surely determined* condition of the possible modes of contagion, by living or inanimate intermediates."

Prof. Gamgee of London, says :

"An objection made against inoculation, and which equally applies to vaccination of man, to variola of sheep, and to rinderpest, is that the inoculated disease is contagious, and that by it, infecting centers are increased. This objection has no value, at

least so far as it concerns pleuro-pneumonia, for the inoculation-disease is not communicable except by re-inoculation. My observations on this point are numerous; during the seventeen years when inoculation was extensively practiced, I do not know of a single example of contagion arising from an inoculated animal.

IV.

Exudative pleuro-pneumonia is a disease of the bovine species, and is not communicable either to other animals or to man, by either cohabitation or inoculation. My numerous observations on this subject have already been related.

Facts noticed by myself and by many other observers confirm this truth. Animals of all species, especially swine, have been fed with the cadaveric remains of pneumonic animals. They were placed in permanent contact with diseased subjects; they have been inoculated with the exudat of the lung. I have made these experiments on goats, sheep, horses, pigs, rabbits, birds, and never did I obtain positive results.

There was even a popular belief, that the emanations of the entire goat constituted a prophylactic against against epizootic pleuro-pneumonia, and many have adopted the custom of placing one of these animals in their sheds, but without any advantage in the point of view of protection to cattle.

"Each parasite," says Mr. Chenier, "has its organism of predilection, outside of which it does not find, or does it imperfectly, its conditions of existence, growth and multiplication. Transported to an improper medium, it dies like a seed in an unfertile soil."

"If to those characteristics of parasites, we compare those of virulency, we are brought to the conclusion of a striking analogy. As the parasites, viruses have their organism of predilection, outside of which they cannot live or grow. The virus of foot and mouth disease, for instance, dies out when introduced into the equine organism."

V.

Before finishing, I believe it advantageous to make some recommendations to those who will inoculate.

The serosity which escapes from the divided lung of a cow affected to the first or second degree of the disease, and sifted or filtrated, is the best to use in the practice of inoculation and should be inserted on one of the lateral faces of the extremity of the tail, by two punctures with a lancet, about the width of two or three fingers apart. The operation is made like vaccination, by incision of the epidermis and deposit of a drop of vaccine in the cellular tissue and in the dermis; the animal is then left to itself without any other care. It is prudent, however, to give him a good clean bed, to protect the wound from infection by contact with decomposed matters.

The liquid of inoculation must be as fresh as possible, as I have often observed that the one, two, or three days old is very virulent.

When the local inflammation becomes too active, a purgative is administered; three or four hundred grams of sulphate of magnesia.

When there appears at the point of inoculation a hard, warm, inflammatory swelling, painful to pressure, we must hasten to make incisions, and to excite suppuration by local irritating agents, for as soon as this is obtained we may be sure that the infiltration will not spread; and the animal is saved.

Some operators remove the portion of the tail above the swelling, and others cut always, to prevent the local accidents which may take place twenty-four hours after the operation, the portion of the tail where the inoculation has been performed.

If, from fifteen days to three weeks after the operation, no appreciable effect at the point of inoculation is observed, it is well to have recourse to a re-inoculation.

When the disease appears in a stable it is necessary to isolate the animals yet apparently healthy, and to inoculate them at once, using, for this, the serosity of the lungs of one of the diseased animals killed at once.

No fresh, sound animals ought to be introduced into infected stables without having them thoroughly disinfected, as without this precaution the newly arrived animals would be brought immediately under the influence of contagion, and the disease would

continue to appear indefinitely. Preventive inoculations applied to this new stock would have no beneficial effect, as it would be at the time of the operation infected through the ordinary channels of contagion.

Before entering the sheds which are infected, recently or of long date, horned cattle must be subjected to quarantine, that is, for three or four weeks placed in a non-suspicious place, remote from infected stables, and be there inoculated the first day of their arrival. When once the inoculation has produced its beneficial effects, they may be placed in infected barns with impunity, without fear of the dangers of contagion. This wise measure is also necessary, because often amongst the newly purchased animals there may be some already affected with latent pleuro-pneumonia, or being in the incubative stage of the disease which everyone knows may be quite protracted.

If cattle owners do not scrupulously follow these rules, they will expose their herds to the effects of the scourge, with so much certainty that inoculation in their hands will then be but a fallacious preventive, which instead of giving favorable results, will only be followed by failures due to the empiricism and carelessness of the operators.

(To be continued.)

REPORT OF CASE.

EMBOLISM OF THE ARTERIES OF THE LEFT HIND LEG FOLLOWING PNEUMONIA.

By A. A. HOLCOMBE, Inspecting Veterinary Surgeon, U.S.A.

The infrequency of recognized embolism in the equine species renders particularly interesting the reports of such cases as have been observed and published in veterinary literature. In the majority of these cases, the embolism results from primarily diseased blood-vessels, and the embolism is found lodged in some

branch of the affected vessel. From the information I can gain on the subject, it would seem that rarely indeed does embolism of the lower animals result from lung lesions. That the case to be described was embolism will, I think, be conceded, and that it resulted from the diseased lung would seem highly probable.

On the 14th of December, 1880, a six-year-old bay trooper—a recent purchase—was sent to the hospital as being “off his feed.” On making a hasty examination, influenza was diagnosed, the temperature being 107° , the pulse rapid, soft and weak, with cold extremities and the mucous membranes of that bright red, slightly tinged with yellow, so often seen in this disease. There being but a slight cough and the respiration good, half-ounce doses of the tincture of belladonna was ordered given three times a day. During the next four days no important change took place, nor was there any improvement excepting the gradual reduction of the temperature to 105° . The appetite was very poor. On the morning of the 18th the respirations were greatly increased in frequency and becoming quite labored. An inspection of the chest revealed the lower two-thirds of the left lung in the first stage of pneumonia. The treatment was now changed to active stimulants, consisting of carbonate of ammonia, camphor and ginger, two drams of each three times a day. The case progressed from this time on to the 21st as usual, the appetite being fastidious and the patient assuming the recumbent position a good part of the time, always lying upon the side of the diseased lung. During this time two two-dram doses of the sulphate of quinia were given to reduce the temperature, which had remained at 105° . On the afternoon of the 21st the lung showed signs of clearing up and the temperature was down to $103\frac{1}{2}^{\circ}$. On the morning of the 22d the respiratory murmur was quite audible in a few places where the lung had been diseased, the temperature lowered to 102° , and the appetite quite good.

At nine o'clock on the morning of the 23d, while making the daily hospital round, I remarked to the steward the rapid improvement of the patient, the pulse and respirations being nearly normal, the lung almost cleared, the temperature at 101° , and the animal bright and playful. At ten o'clock the steward sent word

to me that No. 12 was very sick. Hurrying to the hospital, I learned that a short time after my previous visit the patient had assumed the recumbent position, as usual on the left side, remaining there quietly until nearly ten o'clock, when he got up, began to sweat and to breathe rapidly, then to lie down and get up repeatedly as in spasmodic colic. Being greatly surprised at the sudden change, I made a critical examination of the patient with the following result. He was lying on the left side, steaming with perspiration, nostrils widely dilated and the mucous membrane bright red, respiration rapid and accompanied with a groan, occasional straining as if to avoid fæces, and frequent clonic spasms such as are seen early in poisoning from strychnine. The patient on being made to arise, stood with the back arched, the head held low, the hind feet well advanced and moved only on compulsion. When locomotion was attempted it was seen that the left hind leg was losing some of its power, for although the leg was advanced fully as well as the opposite member it was irregularly placed on the ground and would knuckle over at the fetlock; in fact, I was forcibly impressed with the resemblance which the leg bore to that of a person attempting to walk with one leg "asleep." An examination of the leg revealed nothing, neither did a rectal examination, the fæces being soft, the bladder empty and the circulation of the iliacs perfect.

I could not make a diagnosis, for sensation was perfect in all parts of the body and no lesion could be detected in the lame leg, so I determined to treat the most prominent symptom—extreme physical suffering—and to this end administered a two-ounce dose of tr. of opium with one ounce of sweet spirits of nitre. After a time the patient became more quiet and again rested on the left side. Repeated inspections of the left leg revealed a decreasing temperature of all the parts below the middle third of the tibia. This loss of temperature increased until the lower part of the leg became cold as dead flesh. I believed now that I had a solution to the difficulty, for the pulse could not be felt in the digital arteries, while it was perceptible as ever in the iliacs; no appreciable ingress of the blood to the cold parts took place; the functions of the foot were entirely suspended, while the upper parts of the leg

remained apparently normal. Believing embolism alone could explain the symptoms, the patient was given a small dose of aloes with dram doses of belladonna repeated twice daily. The affected leg was repeatedly rubbed with a strong liniment composed of oil of turpentine, solution of ammonia and olive oil, and thickly bandaged. The patient was put in slings, but after three or four trials was returned to a box stall, for he was continually fretting, seemed irritable, off his feed, inclined to throw all his weight on his supports, while the leg above cold parts was swelling continually. This was on the 27th. On the night of the 28th the patient lay down, but needed assistance to get up. The leg seemed a little warmer than heretofore, and the swelling was lessening. From this time on to the present the patient has been steadily improving; as the leg became warmer the ability of the patient to use it has increased, until now it is nearly recovered. The pulse was perceptible for the first time on Jan. 6th, in the digital arteries, and, although very feeble at first, is now nearly as strong as in the opposite member. That recovery will soon be complete does not seem doubtful.

FORT LEAVENWORTH, KANSAS, Jan. 13th, 1881.

EXTRACTS FROM FOREIGN JOURNALS.

Q ECHINOCCOCI IN THE SUB-LUMBAR, GLUTEAL, ANTERIOR AND POSTERIOR CRURAL REGIONS OF A HORSE.

BY M.M. RANVIER AND DEHORS.

The subject, a heavy draught horse from eighteen to twenty years old, fell on the left hind leg, and ten or twelve days after was found to be lame. The croup was swollen, the swelling being principally marked at the external angle of the ilium, and extending toward the upper part of the flank; it was not painful, and showed no signs of inflammation. Nothing else being found,

a revulsive was applied on the coxo-femoral joint. Eight days afterward the animal presented the same condition and lameness. He was kept to work.

Five months afterward the swelling of the croup had almost disappeared. In the upper part of the flank, near the angle of the ilium, an enlargement existed, painless and not fluctuating. Rectal examination revealed a tumor about the size of a man's head, oblong and slightly fluctuating, on the internal side. Exploring puncture with the aspirator was made, from which escaped a yellowish transparent fluid. A larger trocar being introduced, allowed the exit of a small membrane, very delicate. Eight days afterward a yellowish-white pus escaped from the opening.

There were then general serious symptoms: great dullness, general prostration, poor appetite, pulse small and thready, respiration regular, but short and accelerated, temperature $41^{\circ}3$. What was supposed to be an abscess—the tumor—was opened with pointed cauterization. With the pus which oozed out several little bladders escaped, consisting of a thin, gelatinous membrane, with a transparent, citrine colored fluid, and having in suspension some yellowish-white bodies. The membrane was sometimes colorless, of a dirty white, and again a rosy or deep red color. The liquid remained in all of the same aspect. About thirty of these bladders were removed at this first operation. Treatment consisted of carbolic water dressing.

Two weeks later the animal looked well. Fever had subsided, the tumor had reduced on the outside, as well as on the inside, and numerous vesicles had been discharged. Lameness disappeared on walking. Same treatment.

A week after, the wound of the cautery was closing, expulsion of the vesicles difficult, and the pus had become offensive. A few days later general symptoms reappeared, and on account of weakness and debility of the patient, and the unfavorable aspect of the case, the horse was destroyed.

At the autopsy a voluminous tumor, extending from the left kidney to the superior border of the ilium, was found. It was bosselated, oblong, situated in the sub-lumbar region, in the psoas

muscles, and united by strong adhesions the left kidney with the two last ribs, the body and transverse processes of the lumbar vertebræ, the anterior border of the ilium and anterior crural muscles. Cut transversely and longitudinally, it was found to be formed of irregular cavities, separated by walls of variable thickness, and yellow in aspect. These cavities communicated, and contained a large quantity of grayish pus, in which floated hundreds of echinococi, some in their primitive spheroidal shape and containing a clear liquid, while others in greater number were shrunk and almost dry.

Some of the cavities were distinct and closed. For instance, towards the anterior extremity of the tumor there existed one, subdivided also, and contained vesicles of various size. Some quite large contained a liquid in which floated smaller ones.

Near the superior border of the ilium the tumor extended in the deep gluteal muscles, behind the hip joint, the posterior face of the femur and ended in cul de sac towards the inferior extremity of the posterior crural membrane.

Again, towards the external angle of the ilium it was continued in the thickness of the triceps cruralis.—*Archives Veterinaires*.

UPON THE SYNGAMUS TRACHEALIS AND ON THE DISEASE IT PRODUCES.

BY M. MEGNIN.

There exists for several years back in France, and for a long time in England and America, amongst wild and domesticated gallinaceans, an epizooty which killed those animals by thousands. This disease is due to a parasite, a *red worm* which grows in the trachea and kills the birds by asphyxia. It is the *syngamus trachealis* of Siebold, well-known zoologically, but not so well as to its anatomy and physiology, and unknown as to its development and mode of propagation.

From several years' observation, M. Meguin says that this curious worm develops and propagates as follows:

1. The egg, in a damp but cold medium, preserves its vitality for years.

2. The embryos contained in the eggs develop and hatch at a temperature of 20 to 25 degrees.

3. The development and hatching is much more rapid when the damp medium is nearer the temperature of the body of a bird, say 40 deg.

4. The embryos of *Singamus*, which are anguilluliform, may live in water of ordinary temperature for several days, and even weeks, but undergo no changes.

5. Birds are contaminated in absorbing the embryos contained in their food and drink.

6. Birds are contaminated also in directly absorbing adult worms full of eggs which are expectorated, worms which then look like small earthy lombricoids, or better to the red larvæ of tipulæ of which gallinauous are so fond.

7. Larvæ of ants or other insects which are eat by birds, do not contain embryos of *syngamus*, and cannot be a cause of propagation.

8. Garlic and asafoetida mixed with the food, and salicylic water are the best agents to destroy the embryos and stop the disease.—*Gazette Medicale*.

OBITUARY.

Peter Nostrand, D.V.S., who graduated in 1871, died suddenly on the 9th of January, at the age of 41.

HUMAN AND ANIMAL VARIOLÆ: A STUDY IN COMPARATIVE PATHOLOGY.

BY GEORGE FLEMING, F.R.C.V.S., ARMY VETERINARY INSPECTOR.

(From the *Veterinary Journal*, London, England.)

(Continued from p. 436).

GOAT-POX.

The goat has a variola of its own, which possesses as special and distinctive characters as that of the animals I have already described, and is entirely independent of infection from other species. In some countries this *variola caprina* is apparently unknown, in others it is extremely rare, while in at least one country, Norway, it is a frequent, if not a continuous disorder amongst the caprine population. I am not aware if it has ever been witnessed in this country, where goats are so few in number. For Germany, Hering says the disease is rare.* Hertwig† describes an outbreak, and gives illustrations of the eruption. The animals were at first unwell, and there was diminution of the lactal secretion, with great sensitiveness of the udder—the goats had been in milk about three weeks. The first pock was seen on the udder, and on the fifth day was the size of a pea, standing about two lines above the skin, flat, apex rounded, moderately red, with a small areola, which increased in size. Two or three days afterwards the pocks were reduced to the size of a hemp-seed, pale-red and firmly adherent to the skin. On the tenth day they were quite dry and covered by a thick brown crust, which on the eighteenth day fell off, leaving a cicatrix. The disease had much more resemblance to cow-pox than to sheep-pox. Spinola, in 1847, witnessed a similar outbreak, the eruption being most visible on the udder. In September, 1832, the disease appeared

* *Specielle Pathologie und Therapie für Thierartze*, p. 389.

† *Magazin für Thierartze*, Band vi.

among a drove of goats (54), in Geislingen, attacking first seven, then three of the number. In some of them there was a fever at the commencement, then the eruption of pustules; though generally there was little constitutional disturbance, and only diminution of milk, with soreness of the mammæ before the pocks appeared. Sheep in contact with these goats were not affected.* But Bollinger says it is so infrequent, that in the course of twenty or thirty years scarcely half a dozen cases are recorded. He is of opinion that goats receive the disease either from cattle affected with vaccina, or sheep suffering from sheep-pox. But he admits that though now and again the same form of variola is witnessed in cows and goats, yet that the latter, as a rule, remained exempt from the disease when confined in the same stable with infected cows, and that the inoculation of goats generally yielded negative results. In order to prove that goats may be infected with sheep-pox, he gives the following on the authority of Prietzsch: "In a stable in which sheep suffering from sheep-pox were confined, three goats were simultaneously attacked with the disease, the eruption being the same as in the sheep. Upon the udder were numerous pisiform variolæ, in the form of hard, flattened papules, with a trifling amount of lymph; papules were also distributed over the body, being more numerous upon the hind extremities than the abdomen. Marked symptoms of fever were also present, with inappetence, swollen lips, and a somewhat profuse mucopurulent discharge from the nostrils. In fourteen days convalescence was established. Two other goats were inoculated on the ear with the virus of sheep-pox; a single pustule formed at the seat of inoculation, and the animals did not afterwards take sheep-pox."

That there is no relationship, so far as origin is concerned, between sheep-pox and goat-pox, nor yet, for that matter, human variola, is evident if we look at a country where the latter is all but unknown, and the former is not seen. From 1864 to 1876 inclusive, sheep-pox has been reported only twice in Norway; in 1865 there were two cases, and in 1868 fifteen cases, all due to

*Op. cit., 1856.

foreign importation. According to Hansen, the official veterinary surgeon in central Norway,* in 1867-68-69 and 1874 and 1875, extensive outbreaks of goat pox were observed; and according also to the official veterinary statistics in 1865, eleven cases of the so-called "water-pox" (*variolæ serosæ*), and in 1868 four cases of common goat-pox were recorded in south Norway. Many cases which escape the notice of the Government veterinary surgeons are supposed to occur. In 1871 Dr. Cæsar Boeck, of Christiania, was on a botanical excursion in south Norway, and in July, in Thelemarken, he saw a drove of cows and goats being driven from the woods into their huts. The cattle were quite healthy, but about forty of the goats were affected with a variculous eruption on the udder and teats, as well as about the mouth. In some there were merely deep dark-colored sores remaining, in others—the majority—there were seen thick brownish crusts, about the size of a pea, on the mouth, udder and adjoining parts; while in a few the disease was so recent that, with the crusts, there were also observed pustules from the size of a lentil to that of a pea. From inquiry and examination, Boeck was of opinion that the exanthem had been more or less general over the body, and that there had been fever and resulting emaciation. The milk secretion had been almost diminished, and the fluid itself was drawn with difficulty and pain. None of the goats had died, and no other animals had, so far as the shepherdess knew, been in contact with her drove. The cows were fifty in number, and none of them showed the least trace of disease. The cows and goats were milked indiscriminately by three women, whose hands were not washed from the commencement to the end of the operation; so that there was abundant opportunity for transmission of the disease from the goats to the cows, had the latter been susceptible; while the constant association of the two species, particularly in the closely-packed sheds, gave every facility for infection through the medium of the atmosphere, if this could have taken place. Experimental inoculation would have been tried, but no good lymph could then be found. The epizooty

*Gudbrandsdalen d. h. Gudbrandsthal.

appeared in the spring, among the four-year-old goats which had been kept during the winter by themselves in small sheds. When they joined the other goats at a later period, the outbreak became general in a short time. Flocks of sheep associated with the goats without any disease resulting in them. Sheep-pox—a very fatal disease—had never been seen in that part of Norway. Boeck, who contributes his observations to the *Deutsche Zeitschrift für Thiermedizin* for December, 1879, alludes to veterinary surgeon Hansen's observations with regard to the outbreaks in 1867-68-69 and 1874-75, in Gudbrandsdalen. In the first year the malady appeared in August in two different flocks, numbering 170 goats, attacking without exception the males, kids and those in milk. In the males the eruption was sparse, and limited to some poek pustules on the scrotum. (In the following year the exanthem on the males extended to the inner surface of the thighs.†) Hansen was called in when thirteen of the 170 goat had died, and nearly all the others were affected. On examination of two of the carcasses, he found the eruption all over the body, and pustules and ulcerations on the mucous membrane of the stomach and intestines, as is often witnessed in malignant sheep-pox. The origin of the outbreak could not be accounted for, the goats not having been in contact with strange animals, and there was no similar disorder prevailing among other creatures. “I have practised in Gudbrandsdalen,” says Hansen, “for twenty years, and I have never seen either cow or sheep-pox.” In the goatsheds were sixty cows and eighty sheep, but these remained healthy.

In June, 1868, in another district of the same parish, Hansen was sent for to see a herd of goats, and of 114 eighty-four had eruption of poeks on the udder and teats; twenty were severely affected, and, in addition to the poeks on the lacteal apparatus, there were many on the inner side of the thighs and on various parts of the abdomen, some of them having ruptured and left

†From this it will be seen that the male goats are as liable to the goat-pox as the females. It is the same with the rams associating with flocks of sheep, and which suffer as much as the ewes; and it would be the same with bulls or bullocks, did they consort with cows affected with cow-pox. Sex makes no difference.

large sores. The pain was so acute during milking that the animals cried and struggled, and had to be held. The milk was rather viscid and mixed with blood. The disease existed in all stages among the animals, from red spots to shedding crust and the formation of cicatrices. The outbreak had only occurred eight days previously. Thirty animals were yet unaffected, and these were isolated. The neighboring goat-farms were free from the malady, and Hansen could not account for its presence on this farm; but as it was only distant about half a mile (Norwegian) from the place where it prevailed the previous year, it might have been conveyed from there. In July all the goats on the farm had been infected; at the commencement of August goat-pox had nearly disappeared, and during the entire period of the outbreak the cattle there and in the neighborhood had continued healthy.

On August 17th of the same year, Hansen was again called to attend upon goats at another place, not far from the last, where there were seventy-four goats, only thirteen of which were free from goat-pox. Twelve were severely affected, and three were so ill that they could not follow the others. The pocks on the udder, teats and thighs could be studied from the first or inflammatory stage to the crust-forming and cicatrising period, the cicatrices being distinguishable from ordinary scars by their light hue. The diminished secretion of milk and the emaciation were very marked, though the malady was not so fatal as in the previous year. On four neighboring farms the disease also appeared among the goats.

When the disease once appeared in a flock it spread rapidly, and spared neither young or old, male or female; those goats giving the most milk having, however, the mildest attack, and the males having the pock-pustules most developed on the inside of the thighs. The contagium might have been conveyed to these farms by direct contact with the first infected farm, or, as was more probable, through the medium of servants and children. In the following month a number of other farms were visited by the goat-pox. Some of the goats had phlegmonous inflammation of the udder as a consequence of the disease, and had to be killed.

In 1869 two herds of goats were attacked, but timely and

careful treatment having been adopted, the results were not so serious. The milch goats were the worst attacked, and the mortality was greatest in the largest herds. The total number of cases for this year was 129. In the four succeeding years Hansen did not know of any outbreaks.

In July, 1874, goat-pox broke out in two different districts, one and a half Norway miles apart, three farms being visited by it—one with 150 goats, another with 120, and the third with 60. All of these were more or less affected. The disease first commenced with slight fever; then followed efflorescence, subsequently the eruption on the udder and teats of small vesicles the size of a pea, and which soon became converted into pustules. Not unfrequently suppurating furunculi formed, and the whole udder was involved.

In some instances pocks appeared on the lips. Towards the end of August, there were reported 580 cases of goat-pox in the two localities. On the neighboring goat-farms the disease was not seen. There was no evidence that it could be communicated to mankind, though it appeared not improbable that mankind could convey it from one flock of goats to another. Ten deaths only were reported. In 1875 there were 200 cases. Hansen states that altogether there were 1,300 goats attacked, with from twenty-five to thirty deaths—about two per cent. The incubative period appeared to be short, certainly not longer than a week, while the duration of the disease was from two to three weeks in severer cases. The pock cicatrices were more or less stellate-shaped. Immunity was very rare indeed, nearly every goat exposed to the infection taking the disease. The outbreaks always occurred during the summer months, and the epizooty did not extend beyond Hansen's official district. Boeck and others competent to judge had no doubt whatever that the disease was variola. Neither sheep nor cattle, notwithstanding their constant exposure to infection and being crowded with the goats in close sheds, became infected. Human variola was not present in the district during the years when goat-pox prevailed.

I have entered into these details with regard to goat-pox, because they support in the strongest manner the position I have

taken up with respect to variola in man and animals, and prove that, inasmuch as we have shown that there is cow-pox, a horse-pox, and a sheep-pox, there is also a goat-pox, independent of the variolæ of other animals.

SWINE-POX.

Swine-pox is not a very rare disorder, and though I fail to find more than one outbreak recorded as occurring—though outbreaks may be frequent—in this country, yet I have been assured by a very observant and competent veterinary surgeon that he saw a large number of swine suffering from the disorder in Kent. No small-pox or cow-pox was present in the locality. Like the ovine variola, the *variola suilla* is a general eruptive disease, the symptoms being pretty constant in their development, and resembling those of sheep-pox. After the febrile phenomena, which are often very intense and continue for some days, there appear on the back, abdomen, chest, neck, head and inner surface of the thighs, petechiæ, which soon become papules. Towards the sixth day there are vesicles, and about the ninth or tenth day, pustules; the contents begin to desiccate and form crusts, which are eliminated in a few days, leaving a well-defined cicatrix. The eruption appears discrete and confluent, the disease being benignant or malignant, regular or irregular, according to the form it assumes. Young pigs are most susceptible, and the mortality often reaches twenty or twenty-five per cent. Hering has seen the disease in older swine. The malady is very contagious, and its course and complications, as well as infectiousness, are very closely analogous to those of sheep-pox. One attack protects from another. Felix (*Recueil de Méd. Vétérinaire*, 1827) describes an outbreak which prevailed among the swine in the Dordogne department, during four years; and Rueling,* Greve, Spinola,† Viborg‡, Pozzi, Gasparin, Eisele,§ Hering, and competent veterinary authorities have studied swine-pox at various times. Gerlach has experimentally

*Physikalisch Medicinisch, Oeconomische Beschreibung der Stadt Nordheim, 1779.

†Schweinkrankheiten, 1842.

‡Behandlung des Schweines als Haushthier, 1804.

§ Krankheiten der Schweine.

proved that the disease can be transmitted to sheep, and the sheep-pox to pigs. Cases of accidental transmission from sheep have been recorded. Bollinger mentions that some young swine were attacked after being lodged in a pen where diseased sheep had been located some months previously, and these pigs communicated their malady to others which had not been in the shed in question. But that there is no generic relationship between swine and sheep-pox is again proved by reference to Denmark, where the latter does not exist, and where, nevertheless, swine-pox is sometimes prevalent, as in 1878, when it appeared in several localities in Jutland, according to the veterinary sanitary reports of that kingdom. The same evidence could be given with respect to other countries. Viborg, Spinola and Hering have proved that the disease is readily inoculable to other pigs. Rueling, Viborg and Hering have not been successful in transmitting swine-pox to the horse or cow; though Gerlach succeeded in inoculating a goat. The transmission of swine-pox to mankind has been sometimes noted. Arnsberg,* for instance, knew of three persons who had been infected; and Roell gives similar evidence. Accidental transmission of human small-pox to pigs has been recorded now and again, and that this transmission may take place I do not deny; but it certainly does not prove that swine-pox is dependent for its origin on small-pox. The former occurs where the latter is not present, as in Denmark, and small-pox may rage for years in districts where pigs are numerous, and the latter show no signs of variola. In the Würtemberg reports for 1877, mention is made of the prevalence of the "wild" or *wasserpocken (variola serosæ)* among suckling swine. These pocks soon burst, and their contents mixing with milk, were ingested by the young pigs in the act of sucking. These had in a short time a yellowish-brown eruption, first about the eyes and nose, and then over the entire body. When the eruption was noticed early, and the young pigs were then removed from the sows, the consequences were not so serious; but when the exanthem extended over the entire body, they quickly died. Bathing them in bran water or camomile tea

*Gurlitzund Hertwig, Magazin für Thierheilkunde, band x.

was supposed to have cured a good number. No mention is made of small-pox among people. In 1878, according to the *Veterinary Journal* (vol. vii., p. 210), there was a serious outbreak of swine-pox in many localities in the Hernals and Baden districts. It first appeared among swine of Hungarian origin imported from Odenburg, and from them was communicated to the native herds. The mortality was unusually great. The conditions attending the appearance, course and termination of the disease, were precisely analogous to those which obtain in sheep-pox, and the veterinary sanitary measures in force for the latter were adopted successfully for the swine-pox. No mention is made of sheep-pox, cow-pox or small-pox prevailing at the time.

Dog-Pox.

In the dog, variola has been observed and described by many authorities, and is, in fact, a comparatively well-known disease to veterinarians. It chiefly attacks young dogs, though old ones are not exempted, and one attack affords immunity from others. *Variola canina* commences, as in other animals, with fever, which continues for two or three days, and is then followed by the appearance over a large surface of the body, though rarely on the back or sides, of red points resembling flea-bites, which in a very short time are the seat of papules, and then of vesicles. The contents of these become purulent, and finally dry into a crust, which, being shed, leaves a marked cicatrix. In the dog, as in sheep, goat and pig, the disease does not always maintain the same form; it is sometimes epizootic, and is benignant or malignant. Young dogs nearly always succumb, and a necropsy often reveals the presence of variolous pustules on the mucous membrane of the respiratory and digestive organs. The disease does not appear to be very infectious, though it is contagious and inoculable. It appears to be communicable to mankind, for Bosenroth* saw the disease affecting dogs around the nose, face, eyes and back, and the attendant became infected. The dog does not appear to be very susceptible to the variolæ of other animals, nor yet to that of man. I can find few instances mentioned in

*Magazin für Thierheilkunde, 1860, p. 341.

which small-pox was communicated to this creature, notwithstanding its very close association with mankind, and consequent exposure to infection.* Greve inoculated eight dogs with the matter of human small-pox, and three of them became covered with pustules and died. Vaccination only develops insignificant bullæ containing pus; scarcely any "pit" remains.

I am not aware that variola has ever been observed in the cat.

CAMEL-POX.

The camel has long been known to suffer from variola. Agnelli, in 1850, observed an outbreak among camels in Algeria, the symptoms of which were like those of cow-pox, especially when transmitted to mankind. When the Arabs were inoculated with the lymph they were protected from small-pox. Mason† makes similar remarks with regard to the camel in India. He mentions the accidental and artificial transmission of the disorder to the human species, and states that when children were inoculated from the camel they had a more or less general eruption, which was nearly always malignant, exceptionally mortal.

VARIOLA IN HARES AND RABBITS.

Hares and rabbits are said to have a form of variola, especially in north Germany, and which sometimes is very malignant. It has been believed for a long time, in those countries in which sheep-pox is prevalent, that rabbits receive infection from these in grazing on the same pastures; and it has even been asserted that whole warrens have been cleared of their inmates by the transmitted disease. Astruc, Paulet and Gasparin, a French authority and good observer, state that sheep-pox is frequently

*The supposed cases of transmission are not all conclusive. They are generally of the same kind as that detailed by a writer (G. A. C.) in the *Field* for September 2d, 1871. "Two or three members of the family of a person who was rearing a beagle for me, were ill of small-pox, and some of the bedclothes were being steeped in water preparatory to washing them. The beagle was seen to lap some of the water, and in a few days he died, covered with small-pox. Cases of dogs taking the disease have happened, I believe, but very rarely."

†Narrative of a journey to Khelat, Trans. of Med. and Phys. Soc. of Bombay 1840, p. 214.

conveyed to hares and rabbits; and the observations and experiments of Curds, Dominick, Spinola and Gerlach support the statement. Inoculation from one to the other species has always yielded positive results.

VARIOLA GALLINARUM, ANSERUM, ETC.

Fowls have also their variola, according to the reports of various observers, published during many years. Bollinger has investigated what was supposed to be variola in a poultry-yard at Zurich, but found it to be a contagious epithelioma, chiefly localized upon the head. But what appears to be a true variola has often been studied in fowls, as the loss it caused was very great, and its contagiousness caused it to be widespread. In these outbreaks the birds were dull and feverish, the feathers stood erect, the wings and tail were pendulous, and an eruption of pustules appeared on the head, neck and inner surface of the wings and thighs. In the turkey they appeared as citron-tinted vesicles, surrounded by a red areola. In from twelve to fifteen days after their development these pustules became crusted, the fever disappeared, and health gradually returned. In geese the pustules on the neck not unfrequently increased in size and formed abscesses; the feathers were shed, pieces of skin even became detached, and the resulting lesions were so serious that death was not an unusual termination. The disease was very contagious.

In the official report on the sanitary condition of the domesticated animals in Belgium during 1878, I find that Government Veterinary Surgeon Déjonghe, of Wyngene, describes this variola of poultry. It prevailed as an intense enzoöty during the last half of 1878, frequently attacking all the fowls on a farm, and being most prevalent in low, damp situations. It was markedly contagious, or rather infectious, and the prevailing winds had apparently some influence in its dissemination. Young birds suffered most severely, and bad food aggravated its severity. The earliest observed symptoms were erect plumage (horipilation), complete indifference, *malaise*, and general prostration, anorexia, great thirst, ardent craving for cold water, and rapid emaciation. There appeared on the skin and visible mucous membranes numerous

small nodules, which were soon transformed into pustules. Most frequently these pustules ruptured soon after their appearance, fetid matter escaped, and only superficial sores remained; these generally cicatrised rapidly. Where the skin was thick, cicatrices, often deep, remained. On the respiratory mucous membrane the pustular eruption caused an abundant formation of muco-pus, which sometimes caused death by obstructing the air-passages. Generally, however, a fatal termination seemed to be due to debility, septicæmia, or pyæmia. In birds which survived, complete recovery did not take place for a long time.

(To be continued.)

LAW RELATING TO THE PREVENTION AND SUPPRESSION OF EPIZOOTIC IN GERMANY.

Passed June 23d, 1880.

We, William, by the grace of God, Emperor of Germany, King of Prussia, &c., in the name of the Empire, with the consent of the Federal Council, and of the Reichstag, order the following :

SEC. 1. The following law regulates the measures to be taken in the interest of the prevention and suppression of contagious epizootics of domestic animals, rinderpest excepted.

Are considered as suspicious animals in the sense of the law :

Animals which present signs of such nature as to fear the eruptions of a contagious epizooty.

Animals which do not precisely present signs of that nature, but which make it presumable that the contagious virus was communicated to them.

§ 2. The measures of prevention and of suppression, as well as the direction of the measures to be taken, will be given by the order of the government of each particular state and its organs.

Special commissioners may be charged with the direction of those measures.

The coöperation of the veterinarians which are named by the State, or whose nomination has been approved by the State, will be conformed to the prescriptions of the present law. In case of prevention, or for other motives, approved veterinarians may be called in their place. These last will have the right and duty to fulfil, in the limit of their appointment, the functions allotted by the present law to the official veterinarians.

The particular States shall prescribe the dispositions of detail, relating to the measures to be taken, to the competency of the authorities and functionaries, as well as to the manner of settling the expenses that these measures will incur.

§ 3. Relatively to horses, and animals of victualling belonging to the military administration, the military authorities are authorized to take such measures they may deem necessary to the discovery and suppression of epizootics, so long as these diseases will affect only the property of that administration.

This authorization may be also granted by the governments of the different States to the directories of depots of military remountings, as well as relatively to animals of bovine and ovine breed they may possess; it may also be granted to the directors of the crown and State studs, relatively to the horses found there.

In both cases (art. 1 and 2) the following can be applied by analogy.

The military authorities are bound to inform, as early as possible, the police authorities of the garrison, consignment, and places where troops will pass, of the signs which make suspect the existence of an epizooty, or of those which characterize the eruption, as well as the march followed by the disease and its extinction.

As well, the directors of remounting depots and above named horses, are bound to give the same information to the authorities of local police, when they are directed to take the necessary measures for the discovery and suppression of epizootics.

§ 4. The Chancellor of the Empire has charge of the execution of this law, and of the measures taken on its power.

When the epizooty appears in such a part of the territory of the empire, or in such an extent that it becomes necessary that

the measures taken be applied to the territories of several States of the Confederation, the Chancellor of the Empire, or an imperial commissioner named by him, will see that there is uniformity in the measures taken or to be taken by the authorities of the respective countries; he shall prescribe what is necessary to those effects, and shall give directly, if need be, to the authorities of the interested States, the instructions demanded by the circumstances.

§ 5. The authorities of the States of the Confederation are bound to lend each other mutual assistance in the execution of the measures having for object the prevention and suppression of epizootics.

I.

PREVENTIVE MEASURES AGAINST THE IMPORTATION OF EPIZOOTIES FROM FOREIGN COUNTRIES.

(a) *Restriction to the importation and circulation of animals.*

§ 6. The importation of animals affected with a contagious epizootic disease is prohibited.

§ 7. When in a foreign country a contagious epizooty exists or declares itself among domestic animals to an extent threatening for the animals of the interior:

1. The importation of living or dead animals of the foreign country where the epizooty exists, can be prohibited in a general way, either for some parts of the frontier, or it may be submitted to restrictions which stop or diminish the danger of the importation.

2. The circulation of animals in the zone of the frontier may be submitted to prescription likely to prevent the extension of a disease which might be imported.

The restrictions relating to the importation and circulation of animals shall, in the measure of need, also extend to the importation of animal matters, and of all other objects of contagion.

Communication shall be given immediately to the Chancellor of the Empire of all prescription, abrogation or modification of the restrictions placed on the importation and circulation of animals.

Restrictions relative to the importation and circulation of animals will be, without delay, made public.

(b) *Census of animals.*

§ 8. When the extension of epizooty in a neighboring country becomes threatening, a census may be ordered for the frontier zones, of animals which are there, as well as a regular control of the diminution or increase in the number of animals threatened with the epizooty.

II.

SUPPRESSION OF EPIZOOTIES IN THE INTERIOR OF THE COUNTRY.

1. GENERAL PRECAUTIONS.

(a) *Obligatory declaration.*

§ 9. The owner of domestic animals is obliged to make immediately to the police authority the declaration of the eruptions amongst his stock, of one of the epizootic diseases named in §10, as well as of the suspicious signs making him fear the existence of such disease, and to keep the animal away from the places where there is danger from other animals to be contaminated.

These same obligations exist for the agent of said owner, and also in relation to the animals in transportation to those who have them in charge, and in relation to animals given in keep to other parties, to the owner of respective farms, stables, pastures, &c.

Are also obliged to make the same declaration the veterinary surgeons and all persons which professionally exercise veterinary medicine; as well as the inspectors of slaughter houses, as well as those whose profession is to remove, sell or work on animal cadavers or substances when, before the police have taken measures, they have knowledge of the eruption amongst animals of one of the following epizootic diseases or the apparition of suspicious signs.

§10. The epizootic diseases to which the obligatory declaration is applied are:

1st. Anthrax.

2d. Hydrophobia.

3d. Glanders and farcy of horses, donkeys, mules.

4th. Foot and mouth diseases of bovine, sheep, goats and swine.

5th. Pleuro-pneumonia of bovine.

6th. Small-pox in sheep.

7th. Maladie of coit (dourine) of horses and the coital exanthems of horses and bovines.

8th. Scabies of horses, donkeys, mules and sheep.

The Chancellor of the Empire is authorized to make also for other epizootic diseases the declarations transitorily obligatory.

§11. For the districts where anthrax exists permanently, the governments of the different States of the Confederation are authorized to take it off the obligatory declaration (§9) as long as the disease appears only on isolated cases. In this case the measures of prevention must be prescribed in a general manner and in accordance with the law and the extinction relating to its executions.

(b) *Measures to take to ascertain the existence of epizootic diseases.*

§12. When the declaration (§§ 9-10) has been made or that in any other manner, the existence, real or supposed, of a disease is known to the police authority, this will request the official veterinary surgeon to make the necessary inquiries to ascertain the existence of the disease. He will ascertain the nature, condition and causes of the disease, and will give his opinion as to whether it exists or the supposition of its presence is correct.

In urgent cases the veterinarian may, already before the action of the police, prescribe the sequestration and temporary quarantine of the sick and suspected animals, and if there is need, their inspection. The prescribed temporary measure will be made known to the owner of the animals, or his agent, either by a verbal or official written report, and which will immediately be given to the police.

At the request of the veterinarian the mayor (Vorsteher) of the place will organize the temporary infection of the diseased animals.

§ 13. When, from the opinion of the veterinary surgeon, it is possible to ascertain positively the existence of an epizootic disease

only by the autopsy of a suspected animal, the police authority can order the animal to be destroyed.

§ 14. Upon the declaration of veterinary surgeon that the epizootic disease exists, or that suspicion of its existence is founded, the police authority shall take and execute, as long as there will be danger, the measures of prevention required by the circumstances, and as directed by the present law and police regulations concerning it. If the police authority doubts the correctness of the declaration made by the veterinarian, it shall request the opinion of a superior veterinary authority without however not having the necessary precautions reinforced.

§ 15. When the eruption of foot and mouth disease shall have been established by the advice of the veterinarian, the police authorities may prescribe immediately the measures of precaution necessary after the declaration of new cases of disease as they appear in the infected locality or surroundings, without requesting to that effect another visit of the veterinarian.

As well, in the districts where anthrax exists permanently, it is not necessary to call upon the veterinary surgeon in each case of that epizooty.

§ 16. In all the cases where the veterinarian is called to ascertain the condition of a suspected animal, the owner of the animal shall be at liberty to also call a regular veterinarian to proceed to the investigation, the prescription of measures of prevention being nevertheless executed.

However, in the case of difference of opinion between the veterinarians, relating to the existence or suspicion of an epizootic disease, or in the case where for other reasons there are serious doubts as to the correctness of the data given by the official veterinarian, the authority shall at once request the opinion of a high veterinary authority, and will act according to his decision.

§ 17. All cattle and horse markets shall be inspected by official veterinarians. This measure may be applied also to animals collected in public or private places, to be sold at public sale, to male stock animals placed at the disposition of the people for breeding purposes, to public shows of animals, and to gatherings of horses and cattle requested by the authorities. The veter-

inary surgeon is obliged to report immediately to the police authority all cases of epizootic contagious diseases, as well as all suspicious symptoms he may have noticed at the market or amongst the animals above mentioned, and after carefully examining the nature of the case, to request the application of the necessary preventive measures of the police.

If there is danger imminent, the veterinarian is authorized to direct, already before the intervention of the police, the sequestration and isolation of diseased or suspected animals.

(c) *Preventive measures against the danger of epizootic diseases.*

§ 18. When there is danger of epizootic disease, and as long as this will last, the following preventive measures may, according to the cases, the character of the danger, and taking in consideration the interests of circulation, be prescribed by the police authorities, except the observations of the special prescription, established by the present law for some particular epizootic diseases.

The recourse formed by the owner against the preventive measures prescribed by the police authority has no suspensive effect.

§ 19. 1. Isolation, surveyance or observations by the police of disease or suspect animals.

The owner of an animal isolated or submitted to police observation, is obliged, if requested, to take such measures that during the isolation or observation, the animal cannot leave the place, stable, yard or pasture assigned for it, and that it will remain free from contact or community with other animals.

§ 20. 2. Restrictions in the mode of use, work or transport of diseased or suspected animals; of their products or objects which have been in contact with them or which, generally, are of nature to propagate the disease.

Restrictions for the transport of animals exposed to be contaminated, and of those which are of nature to propagate the disease.

§ 21. 3. The interdiction to bring to common pastures animals from different stables or sheds and to allow feeding in certain places selected afterwards; interdictions to bring animals to com-

mon wells or troughs, as well as to put them in connection with diseased or suspected animals upon public or common roads or pastures.

Interdiction to all dogs to run about.

§ 22. 4. Isolation or sequestration of the stable, shed or other place where diseased or suspected animals are, that of the farm, locality, pasture or suburbs of the town relatively to the circulation of animals and with objects of contagion.

Isolation of the farm, place, pasture or suburbs of the town, cannot be commanded unless the existence of the epizooty has been pronounced by the official veterinarians.

Isolation of a place or suburbs of a town cannot take place unless the disease presents by its nature, an important and general danger and unless a certain number of animals are already affected. Isolation can be limited to certain streets or parts of a town or suburbs. Isolation, by police authority, of a stable, shed, or other place where animals are, of a farm or pasture, obliges the owner to take all precautions which are required for its efficacious execution.

§ 23. 5. Inoculation of animals threatened by the epizooty, the veterinary attendance of diseased animals, as well as the restrictions belonging to the right of experiments for recovery.

Inoculation or veterinary attendance can not be ordered only in the cases indicated in the present law and according to its prescriptions of detail.

Inoculation ordered by the police shall be made under the survey of the official veterinarian or by himself.

§ 24-6. Slaughter of diseased or suspected animals.

Slaughter cannot be ordered except in cases expressly named in the present law.

The prescription of immediate slaughter of the diseased or suspected animals is not, where it is mentioned in the present law, to be applied when the animals are sent to a superior school under State survey, to be used as means of instruction.

§ 25. When animals, for the circulation and use of which restrictions exist or which are isolated, are used contrary to the interdiction or are found outside the place assigned to them or in

places prohibited to them, the police authority may order their immediate slaughter.

§ 26. The removal of eadavers, so that they should be harmless, of animals dead from the disease or slaughtered as having been sick or suspected, and that of parts of eadavers of said animals which are likely to propagate the disease (meat, skin, intestines, horns, hoofs, &c.), as well as the bedding, manure and all other objects coming from diseased or suspected animals.

§ 27. Disinfection of stables, sheds and other places where these animals were, and disinfection and useful suppression of the tools and other objects which have been in contact with those animals, particularly also the clothes of persons which have been in contact with diseased animals.

If judged useful, disinfection of persons who have been in contact with diseased animals may be ordered.

The execution of these measures shall take place, according to the orders of the official veterinarian and under the survey of the police authority.

§ 28. 9. Interdiction of eattle and horses from markets as well as from public shows of animals in the locality or its surroundings where the disease exists, or exclusion from markets of some species of animals.

§ 29. 10. Visits by the veterinarian of animals exposed to contagion, which are in the locality or surroundings where the disease exists.

(To be Continued.)

INFECTIOUS DISEASES.

BILL TO PREVENT THEIR INTRODUCTION AMONG DOMESTIC ANIMALS.

Mr. Williams introduced in the United States Senate, on Tuesday, a bill to prevent the introduction or dissemination of infectious diseases among domestic animals in the United States. The bill makes it unlawful to import or introduce into the United States

from foreign countries, or into any State or Territory, any animal affected with a communicative, infectious or contagious disease, except in accordance with the rules and regulations adopted by the National Board of Health, or those of any State or Territory made in pursuance of the bill. It prohibits the sale of domestic animals affected with contagious diseases, such as lung plague, pleuro-pneumonia of cattle, splenic or Texas cattle fever, foot and mouth disease, hog cholera, etc., in violation of the provisions of the bill; directs the National Board of Health or its Executive Committee to report to the President whenever any place in the United States is considered to be dangerously infected with an infectious disease of domestic animals, and upon public notice of such fact being given by the President the removal of such animals from such infected district is made unlawful, unless carried on in accordance with rules and regulations made by the National Board of Health.

The bill also authorizes the National Board of Health to investigate and report on diseases of animals prevailing in the United States or in countries from which the United States may import domestic animals for breeding or other purposes, and also to draft rules and regulations deemed necessary to arrest or prevent the spread of infectious diseases among domestic animals. It authorizes the National Board of Health to appoint veterinary surgeons, who shall be ex-officio members of the Board, together with other veterinary surgeons to act as inspectors.

To meet the expenses to be incurred in carrying out the provisions of the bill the sum of \$1,000,000 is appropriated, to be dispensed under the direction of the Secretary of the Treasury on estimates made by the National Board of Health.—*Farmer's Magazine*.

PROVISIONS OF THE BILL ESTABLISHING A BUREAU OF ANIMAL INDUSTRY.

WASHINGTON, Jan. 28.—The bill reported to-day by Senator Johnston, from the select Committee on Contagious Diseases of Domestic Animals, provides that the Commissioner of Agriculture

shall organize a "Bureau of Animal Industry," and appoint as its chief some competent veterinary surgeon, approved by the National Board of Health, whose duty it shall be to collect and report all such information upon the subjects referred to as may be valuable to the agricultural and commercial interests of the country. For the purpose of investigation, and the prevention and cure of such diseases, he is authorized to call to his aid the National Board of Health, and to employ in addition to an agent in each State and Territory for the collection of local information, two Commissioners, one of whom shall be a practical stock-raiser, and one an experienced business man, familiar with questions pertaining to commercial transactions in live stock, whose duty it shall be to advise with regard to the best methods of treating, transporting, and caring for animals, and of providing against the spread of contagious diseases. The bill further provides that it "shall be the duty of the Commissioner of Agriculture, through the chief of the bureau, in connection with the National Board of Health, to prepare such rules and regulations as they may deem necessary for the speedy and effectual suppression and extirpation of said disease, and to certify such rules and regulations to the executive authority of each State and Territory, and whenever any State or Territory shall accept the same, then it shall be the further duty of the Commissioner of Agriculture, through the said chief of bureau, to assist in the execution of such rules and regulations." It is made the duty of the Secretary of the Treasury to establish quarantine stations at such points as may be necessary, and to "establish and carry into effect such regulations, consistent with State laws, as may be necessary to prevent the spread of said diseases by importations from abroad," and he is authorized to employ Customs officers and revenue vessels for these purposes. The bill further provides that "it shall be unlawful to import or introduce into the United States from foreign countries, or into one State or Territory from another, or to offer for sale, any domestic animal affected with contagious disease, or which has been presumably exposed thereto, except in accordance with the provisions of this act and the rules and regulations adopted in pursuance thereof." To meet the expenses

that may be incurred in carrying out its provisions, (including one for the reimbursement of the value of infected animals purchased and slaughtered in States or Territories accepting the proposed rules and regulations,) the bill appropriates \$200,000 to be disbursed under the direction of the Commissioner of Agriculture. —*N. Y. Times.*

SOCIETY MEETINGS.

THE MONTREAL VETERINARY MEDICAL ASSOCIATION.

This Association held its regular fortnightly meeting in the lecture room of the Veterinary College on Thursday evening last, the President, Mr. C. J. Alloway, V. S., in the chair. A full attendance of members was present. At the close of the usual preliminary business, the chairman requested Mr. P. Paquin to describe his case. The reader said the subject of his communication was a case of tetanus, commonly called lock-jaw, in a horse which he treated last summer. He fully described the symptoms and mode of treatment, which consisted in small and repeated doses of chloral hydrate, under which the animal finally recovered. An interesting discussion followed, and the reader was complimented for his skill and success. The chairman next called upon Mr. Alexander Glass to communicate his case of purpura hæmorrhagica, which had been successfully treated at the College Hospital. Mr. Glass said his case was a mare which had been suffering from influenza during the late epizootic outbreak, and that the purpura had followed as a sequel. He fully described the carefully-noted symptoms, together with the treatment, which consisted of one and a half ounces of ol terel made into a ball with a sufficiency of lina farina and repeated four times a day; she likewise got small quantities of ferrous sulphate, under which treatment she gradually recovered. In the discussion that followed all present approved of the treatment, and agreed that the marked beneficial effects of the remedies showed their efficacy in counteracting the destructive changes in the blood which are

characteristic of the disease. Mr. B. D. Pierce next introduced his paper on the subject of "Veterinary Dentistry." The essayist began by describing the formation, anatomy, mode of growth, &c., of the dental structure of the lower animals; he fully described the different malformations and diseases usually met with, especially those peculiar to the equine. He likewise alluded to the practice of dishonest dealers in filing down the incisor teeth of aged horses and then staining a black mark on their table surface with some chemical agent, so as to make them assume the appearance of a young mouth. This operation, he said, was commonly known by the name of "bishoping," and was one that could readily be detected by an experienced person. Mr. Pierce likewise drew the attention of the members present to the subject of dentistry, and thus protect the credulous public from imposition by men who style themselves veterinary dentists, the majority of whom are ignorant of the first principles of the anatomy, physiology, structure or functions of the organs they profess to treat. The reading was listened to with attention and followed by a lively discussion.

Mr. A. W. Clement proposed and Mr. C. Ormond seconded that Mr. W. Bell be admitted a member of the Association. Carried.

Mr. M. C. Baker, V.S., proposed, seconded by Dr. W. McEachran, a vote of thanks to the essayists. Carried.

At next meeting, February 3d, Mr. E. J. Carter will read a paper on "Counter Irritation," Mr. R. Price will communicate a case of "Influenza" and Mr. C. B. Robinson a case of "Nephritis".—*The Gazette (Montreal)*.

BIBLIOGRAPHY.

Nouveau Dictionnaire pratique de Medecine, Chirurgie et Hygiene Veterinaires. (New Dictionary of Veterinary Medicine, Surgery and Hygiene.)

This most excellent work, started a number of years ago by M. H. Bouley and Reynal, the publication of which was so long in-

terruted by uncontrollable circumstances, is to be continued, and its publication completed as soon as possible.

The authors, amongst whom figure the names of M. H. Bouley, A. Sanson, Trasbot, Nocard, P. Bouley, and others, are sufficient proof of the excellency of the work and of the thorough and masterly manner with which all articles will be written.

The eleventh volume has just been published, and amongst the treasures it contains we mention as those which would prove of immediate interest to American readers:

Jugular Vein—Tongue (anatomy, physiology, external forms, pathology)—*Larynx* (anatomy, physiology, external forms)—*Cartilaginous Quittor*, *Discharge* from the nose, *Keraphyllocele*, *Lampas*, *Cysts*, *Leucocythemia*, *Lactation*, *Milk*, *Jaundice*, *Measles in Pig*.

NEWS AND SUNDRIES.

VETERINARY COLLEGE FOR IRELAND.

Application has been made to the Lord Lieutenant of Ireland, by a deputation in which the absence of veterinarians was observed, to obtain authorization to establish a veterinary college in Dublin, for Ireland. The new venture, amongst special privileges, asks for a grant of £10,000 to start with, and it is said that even with this the school could not last more than two or three years. Application is also made for permission to grant their own licenses without being in connection with the Royal College in London. Much doubt is expressed as to its need, as also to its success.

FOOT AND MOUTH DISEASE IN ENGLAND AND IMPORTED TO AMERICA.

The *Veterinary Journal* says that it is a serious matter for reflection that foot and mouth disease has reappeared, after a

prolonged absence from the country, and is somewhat rapidly extending. Recent information says that a herd of two bulls and eight heifers, brought to America from London by the steamship "France," on being inspected by Dr. J. D. Hopkins, were found suffering with that disease.

EXCHANGES, ETC., RECEIVED.

HOME EXCHANGES.—Medical Record, Surgical Reporter, American Agriculturist, Scientific American, National Live Stock Journal, Country Gentleman, Turf, Field and Farm, Boston Cultivator.

FOREIGN EXCHANGES.—Clinica Veterinaria, Recueil de Medecine Veterinaire, Archives Veterinaires, Journal de Zootechnie, Gazette Medicale, Revue d'Hygiene, Revue Dosimetrique, Veterinarian, Veterinary Journal, Revue fur Thierheilkunde und Thierzucht, Schweizerisches Archiv fur Thierheilkunde und Thierzucht, Archiv fur Wissenschaftliche und Practische Thierheilkunde, Repertorium der Thierheilkunde.

JOURNALS.—Maine Farmer, The Independent Practitioner, International Journal of Medicine and Surgery, Farm Journal, American Farmer, Farmers' Magazine, The Gazette (Montreal).

BOOKS.—(from Dr. Lanzilotti-Buonsanti) Gazette Medico-Veterinaria (5 vols.), Archivio di Medicina Veterinaria (3 vols.), Compendio di Anatomica Speciale del Dr. E. Sertoli, Compendio di Anatomica Descrittiva Veterinaria e Comparata del Dr. F. Zouoli, Trattato di Pathologia e Terrapia Chivurgica del Dr. Lanzilotti-Buonzanti. Contagious Diseases of Cattle, Report of C. P. Lyman, F.R.C.V.S.

COMMUNICATION.—A. A. HOLCOMBE.

AMERICAN VETERINARY REVIEW,

MARCH, 1881.

ORIGINAL ARTICLES.

NON NOBIS SOLUM.

ADDRESS DELIVERED AT THE COMMENCEMENT EXERCISES OF THE
AMERICAN VETERINARY COLLEGE.

BY JEROME BUCK, ESQ.

*Mr. President, Ladies and Gentlemen, and Gentlemen of the
Graduating Class :*

The beautiful, unselfish and appropriate motto of your college, *non nobis solum*, fully expresses the boundless and hearty views, that have given vitality, stability and success to this humane institution of learning. *Not for us alone!* is the key note that has touched the tenderest chords of human sympathy and aroused in responsive expression, a higher humanity and a more exalted endeavor. No such enlightened and extended generosity has softened the stern features of any previous age, as proposed by the motto *non nobis solum*. The exquisite yet enervating refinements of the splendid and sensuous existence of Greek philosophy and art rarely took in its soft dalliance the welfare of the animal

creation; the eagles of Rome were only glorified for carrying to ultima thule the science of law and of arms, through the irresistible genius of Cæsar and the stalwart prowess of the Roman soldier. We almost question the absolute supremacy of our civilization and hesitate over our marvellous achievements in science, art and philosophy as we dubiously contrast them with the bold, sweeping and consummate triumphs of former civilizations. We have not gone beyond the deftness and grace of the chisels of Phidias and Praxiteles, or the pencils of Apelles and Zeuxis. We have not surpassed in military genius and energy the matchless swords of Alexander or of Cæsar. Modern philosophy with the tubes of Galileo has not swept the stars with a much more certain gaze, than the astronomers of old, nor gone beyond in profounder depths of metaphysics the rhapsodies that Plato taught on the porches of the academy. Yet in all their untrammelled reaches, in all the soaring liberality of their educated and refined natures, no such divine light illuminated the most glorious of their achievements, as that which emphatically exacts from us our fervid sympathy and highest appreciation. *Not for us alone!* The conquest of Bucephalus by Alexander was not under the benign teaching of your motto, for the glory was all Alexander's and none for the horse. Neither can we find place for the pompous Icilius under its liberal scope: the marble manger for his horse was but an expression of the wealth, grandeur and vanity of the Consul. At a more recent period, however, a horse achieved the glory of martyrdom for exhibiting the bright traits of a keen intelligence. Captain Banks in 1609 with his horse ascended the dome of St. Paul's in London, to the astonishment of the beholders, and subsequently performed at Rome such startling feats, that it was decreed by a less intelligent body of envious brutes, that the horse and its owner should perish at the stake as enchanters. Who would rather not die with such an intelligent and affectionate animal, than live an age and tolerate the ignorance and superstitious society of his bifurcated inferiors, with the unenlightened faith of the poor Indian

Who thinks admitted to that equal sky,
His faithful dog shall bear him company.

Such institutions as yours are the corner stones of practical Christianity. In Greece and Rome in the plenitude of their enlightenment and power, there were no veterinary schools, not even a hospital, nor a poor-house, nor a retreat for the insane; nor were the great men of Greece and Rome much commemorated for their philanthropy and benevolence. How broad, how extensive, how universal your benignant objects, bringing all animated creation into the wide and unfettered compass of divine sympathy. Is the golden motto based upon disinterested humane instincts, or are we but practically extending the narrow selfishness of our mercantile natures? Are our sympathies quickened by a swift recognition of the helplessness of the dumb creation, or do we sordidly yield comfort and succor to them because of their uncomplaining helpfulness to us. The philosophy of the motto is so pure and exalted that it seems to be divorced from worldly considerations and to be the natural sequence of the practice of the highest Christian civilization.

To some of you it may have happened during the recent sharp and boisterous weather, in passing along a city street, however crowded, to note what varieties of animal life were in sight. If so, doubtless, such were touched at heart to see that the horse was the only friend of man that was his willing aid in his skirmish with the elements, with which civilization ever seems at war.

I need hardly except the fair sex, not those who rebel at being included under the generic word man, any more than their most sensitive sisters who would rather encounter the bitterest storm than the odium which for them the word strong minded carries. All these, upon such a day as I have in mind, were safely quartered at home, and if one permitted himself to pursue the train of thought so suggested, how far it would lead!

In the removal of rock and ground to make room for the stately palaces, grand warehouses and the comfortable homes, in the bringing material for the erection of these to the right place, in the transportation of men and the food of man and of merchandize between them, how active and indispensable has been this good, faithful friend and efficient aid.

Next, the mind making excursion beyond the city to the forests

and the fields, might be even more impressed by reflecting that in the removal of the forests and the substitution of the meadows and the fields, in the development of agriculture, without which civilization must perish, with which encouraged and renewed, its progress is capable of putting foot on the highest stage this side heaven. In the development of civilization and agriculture our faithful horse has been our most helpful friend. It does not lessen our estimate of the benefit of his services that he has been helped himself in their performances. If their ancestors had not helped to extract stumps and haul logs in the outlying country when New York was a village, we should have fewer draught horses upon our streets to scan and admire; he is too short-sighted for your profession who does not admire often the quivering sides, tense muscles and flashing eyes, which here and there in the city make part of its interesting panorama of animal life. There is a mysterious community, says an eloquent orator, between man and the lower animals with which Providence has associated us. There are few things in which the wisdom and goodness of a superintending Providence are more apparent than in the relation established between man and those domestic animals which compose his family. What could have conducted man to the selection of those animals with which he has surrounded himself, to share his labors and minister to his wants, but the unseen power of Providence guiding him to those whom time and patience would enable him to domesticate, to the exclusion of others destined to preserve their native ferocity. It is evident to my mind that man was led into these associations by a wisdom beyond his own; that those higher principles which led him to organize families, communities and nations, have led him also into these humble but scarcely less important associations with the domestic animals. Look at the wonderful phenomenon of vaccination, a mild and gentle disease which we have borrowed from the cow, and which furnishes us an all but infallible protection against one of the most frightful maladies that may waste mankind. Perhaps it was from this community of nature between men and the lower animals that the Roman jurists were led to define the law of nature as that law which is common to all animated beings.

They are endowed with an animal nature quite similar to our own; they are subject to laws of health in a great degree analogous. If a farmer would have his stock in good order for work or milk, or meat, it is just as necessary that they should be kept in good health, as that we ourselves should be in good health for the discharge of the duties or enjoyment of the blessings of life. These domestic animals not only have active powers like our own, subject to the same laws of health, but they have a nervous system closely resembling ours. They are sensible to all the degrees and varieties of pain, and as if to mark a sacred community of suffering between us and them, they express it in the same way that we do. Though Providence has given to man what it has denied to the lower animals, the power of describing his sufferings in words, yet in the extremity of pain he abandons language and takes refuge in groans and cries. The suffering beast and the suffering man speak the same inarticulate language, and the poor dumb animal is entitled to the same exemption from gratuitous pain. The person who subjects his horse or his ox to unnecessary suffering may walk on two legs and counterfeit humanity, but he is a brute. General Pleasanton, the eminent cavalry leader of the army of the Potomac, speaking recently about the nervous system of the horse, says, "that horses are like men. There are men who, without being cowards, have not the nerve to go into battle. Everybody who has been in battle will tell you that. It is so with some horses. They haven't nerve to go into a fight. I have seen horses go through everything to get away from a battle-field. They would commit suicide by jumping over a precipice or before a locomotive. Give the most valuable horse in the world to a fool who is incapable of loving him, and he will spoil him in a day."

I can almost imagine, as I contemplate our friend's part in agriculture, the Genius thereof hovering over fields of golden grain that woos the wind upon the slopes of twice ten thousand hills, and about to confer a more beautiful sign of her favor upon those who under Providence contributed to her delight at the bounteous sight, long hesitating whether her first token should descend upon the horse or upon man. As surely as it is worth

while for us as a nation persistently to renew and maintain an interest in the cultivation of the fields, so surely we should do what we may to care for and develop the horse. His strength and his speed, his fidelity and his docility will take care of themselves if only we will not thwart his natural tendencies. His speed as well as his strength, taking as much care not to overdraw upon his speed as not to overtax his strength.

With such disposition towards him we may hold a good race an exponent of advancement in social life, well up with, not in the rear and out of sight of an exhibition of the fine arts. The part which the two-legged animal has taken in the past, perhaps not in the immediate past in what is known as a race, often has deserved reprobation. But the share of the four-legged in that institution is altogether to his credit. Injustice, as is often the case, has marked man's treatment of the subject by his attributing to a silent friend, faults which he should have avowed to be his own. Some of those philosophers who think that man assumes that the visible creation is, as between him and these dumber animals, all prepared and designed for him rather than for them in part without satisfying proof to justify his arrogance, would probably say, therefore, that he is often unjust to them both ways. He claims more than his due, and shuns censure by falsifying about the fault. This, however, involves a question which you do not expect me to decide, or even to seem wise about. I am not sure that the undistinguishing use of a common term like 'beast' to describe various kinds of quadrupeds, helps to do injustice to the horse. In its secondary sense, this word, for example, carries a meaning which we would hardly select to describe an amiable personal friend. May-be something of a lack of generosity in man; an exaggeration of his own merits at another's expense, is to be found even here. Certain it is that, whoever wrote

"The nobler spirit bore the load,
The beast, it was that spurred and rode,"

did not draw an unparalleled picture.

But really, we may sincerely enough regard Longfellow with something of the feeling with which we cherish the poet from whom he took his name, and for Dexter reserve a little of that

admiration which we seem to have for the dexterity of the successful politician and average public man.

Great and fertile minds have given good precedent in this. What fervor of admiring contemplation is there in the language of Job: "Hast thou given the horse strength? Hast thou clothed his neck with thunder? Canst thou make him afraid as a grasshopper? The glory of his nostrils is terrible. He paweth in the valley and rejoiceth in his strength. He goeth on to meet the armed men. He mocketh at fear and is not affrighted, neither turneth he back from the sword. The quiver rattled against him, the glittering spear and the shield. He swalloweth the ground with fierceness and rage, neither believeth he that it is the sound of the trumpet. He saith among the trumpets ha! ha! and he smelleth the battle afar off, the thunder of the captains and the shouting."

Rosa Bonheur and Schreyer would envy, I fancy, some of yourselves, your knowledge of those inward traits of the horse, of which they portray but the outward sign. Virgil, in the melodious measure of the resounding feet of the steeds over the plains, found sympathetic movement with his rhythm. In that treatment of the misty past of which Homer supplies the legends, we discover that his poetic admiration of the clash of war kept kindly eye and ear open, hardly less for the exploits of the chargers than for those of the charioteers. So important a part do man's domestic neighbors in animal kind serve in stimulating his better emotions, that one is tempted to believe that a horseless sphere would make but an indifferent heaven. Superstition has often attached wings to the human form. But that magnificent power of poetical creation which made rich the ancient Greek and Roman races happily figured the horse with wings and rode him demonstrably to the highest heaven of invention. The intimate association of this animal with the destinies of man seem somewhat shadowed in biblical imagery when death is seen mounted on the pale horse. The glimpse which we catch of the noble animal constrained to help in deeds of blood alien to his nature, prepares us to note farther how tardy justice has been towards him, if not always in recent generations.

If the language in Shakespeare extorted from one of his characters by the terror of menaced death is not by that terror exaggerated and the

“Poor beetle that we tread upon,
In corporal sufferance feels a pang as great
As when a giant dies,”

What a list of grievances endured by an abused ancestry could be presented by every horse who shall patiently toil upon the stones of West street or give his owner an airing in the park to-morrow.

Well may this thought soften our feelings towards the noble animal. That it does so, as we regard his unvengeful nature of itself entitles him to the gratitude of man, to keep in sympathy with his generous qualities, to pity his wrongs, to be touched at beholding his superiority to malice and rancor, will help a man, will help a people towards godlike majesty, and the exaltation which charity confers. Keen susceptibility of that kind, combined with a brain and hand efficient to execute his impulses, can make of a man such a deserver of the praises of his fellows as Henry Bergh. Giving tongue to the sufferings of the mute as he does, warring as he does against the cruel and arrogant of his own kind in behalf of an inferior kind which would not seem arrogant, even could we understand their gambols and gestures, there is promise in that people who own and can with pride point to Henry Bergh as a representative man. Those who will listen to him are sure not to go backwards in their appreciation of speed and song. Indirectly even in these, though speechless and songless, our faithful friend may be a minister to man. We discover great poetic beauty in the biblical recital of the ills of human life. Along the action of Mr. Bergh and his society, so far as the same are exponent of the sufferings of our dumb friends. runs there not poetry of even tenderer cadence visible and audible to *Him* without whom “was not anything made?”

It is not by virtue of being a biped merely that man can be entitled to dominion “over the fish of the sea, over the fowl of the air, and over the cattle,” and by showing himself qualified for that masterhood one will be sure to take thereby the esteem of

his peers. After all, and at best, the subjects, many of them, will have a hard time. What other animal than the horse do we permit to live only away from native pastures, to die only in service as we say, with the harness on; to die as I saw one lately after the light of day had gone out, prostrate between a street railroad track and a bank of ice, while demon-like almost the monstrous omnibus seemed to press with peculiar malignity upon him.

In view of the purposes of this institution whose commencement is here observed, and recurring to the motto, were there such a thing as an obverse of the divine countenance and were a legend needed to encircle it, I can imagine, gentlemen of the graduating class, none more fitting than this motto. But wear it next your hearts as you go forth, and the pride of Alma Mater in you and you in her, shall be continued and reciprocal. You want from me no argument in defense of your position. At the bar of an intelligent public opinion you stand rather in the attitude of prosecutors than of defendants. By virtue of your profession you arraign cruelty and narrow-minded tyranny towards a kind that cannot rebel and exact charters, and who are not given to bloody revolution. You are to help them, and yet your names will not be gazetted or your shoulders adorned.

“A power to guess at gratitude untold,
And hold it guessed as precious gold,”

is more necessary to you than to the physicians of speaking man. Yet who does not value one expression of the kindlier emotion enrolled in the eye more than many delivered from the voluble tongue?

“On shining orbs is writ the praise,
Of Him who rules them in the skies,
Unsullied, unconfused and clear,
Unseen by sordid human eyes.”

If you are the fortunate possessors of the power mentioned, every epithet conceived in ignorance and used by the vulgar must fall harmless at your feet. The title “*horse doctor*” will sound as one fitted to arouse in you pride and pity for those who may fancy it to be a term of opprobrium. To watch the advancement of science and to apply it wherever it is applicable for the

benefit of the horse, the trusting and toiling friend of man, is a portion of your future duty.

Gentlemen of the graduating class: Your most constant and uninterrupted application is demanded, as well as habits of extended observation. You have been trained for life and influence and action. Leave not a field of nature unopened. Quicken every faculty of observation. Not a tree "from the cedar that is on Lebanon, even unto the hyssop that springeth out of the wall," that shall not be noted. Know the names of the gems that sparkle in the sun, as well as those of the shells that blush in the sea. By extending the fields of knowledge, you can secure the hearty sympathy and active coöperation of those who walk in the other paths of medical science. The Jenners and Hunters, the Coopers and the Abernethys "will welcome you to a closer and a warmer fraternity. You have had in your professors men of high and deserved distinction, who have not thought that the pride and affluence of their ripened faculties and wide experience could blush and be diminished in their efforts to ameliorate the condition of the lower races of animals. They have been encouraged to do this by the highest and best and wisest and most humane of their noble profession, and they extend every encouragement to you to surmount and overcome every mean and low suspicion of inequality, by a hearty and earnest endeavor to reach the glowing heights of the utmost professional possibility. Your Alma Mater deserves well at the hands of a sympathetic and enlightened public. She first saw the necessity and felt the humanity to extend to the dumb creation the soothing benefit of scientific skill, and show the world that genius and learning were never better employed than ministering to the pitiful distresses of the uncomplaining animals. All honor to her as the pioneer in this noble and christian work. I repeat, so act that you will command and enforce the respect of the most learned in other departments of medical science. And, why not? The parts of knowledge have a kindred relation with each other. The mind is as expansive as it is immortal. It grows by what it feeds on, and its true stores of real knowledge are no more felt to be a burthen than the resistance of the ever-present and ever-pressing

atmosphere retards the skyward eagle. You must be instituted in the same discipline and still reared in fellowship and communion with the wisest and best of men. Remember that to-day you commence your professional careers. Your diplomas do not attest that you have exhausted all of the varied stores of learning. We never can complete our education. New truths glide before us in every rolling star, and sparkle in every drop of dew. The diploma is no testimonial of perfect efficiency, but it is rather the attestation that you have laid a foundation upon which you expect to build a superstructure of ampler knowledge. You must now investigate more thoroughly for yourselves; there is no sympathetic professor at your side, to admonish, caution and relieve. Remember that your diplomas, more honored than the star and garter, proclaim you to Christendom the friend, the protector and guardian of those who cannot speak for themselves. Your duties are responsible, honorable and sacred. As I have intimated, none of the golden sands of Pactolus may lift you to opulence, nor will, perhaps, the trump of fame proclaim your names from the house-tops, nor may they be spoken by the eloquent lip or sounded by the glorious lyre. You may not obtain the marble statue or the trophied urn, but a greater and diviner guerdon will come to soften the asperities of this life and the crowned blessings of the life to come. "For inasmuch as ye have done it unto one of the least of my brethren, ye have done it unto me."

Perseverance in diligence, continuance of an education begun rather than forgetfulness of its primary stage, a gathering of well ripened fruit from a tree, the young fruit-tree which you have just planted, rather than an effort to graft what others shall grow upon you, an effort quite sure to stunt and blight it: be these your practice, course and aim. No degree of intelligence, skill nor kindness can be too high to be of use in your profession, and intelligence, skill and kindness are all sure to be found capable of growth as long as men are assiduous to make them grow.

As you go forth a graduating class from this institution, be it with a resolution that kindness as well as skill shall distinguish you in your calling. So shall you act a principal part in helping to make the world blossom like a rose. If any seek to belittle

that calling, believe them thereby to be belittled, or that your yourselves, failing that belief, are unfit for your profession. Remember your profession is esteemed by some as the noblest of human avocations, and in its ranks have flourished some of the greatest ornaments of physical and moral science. You must regard it not only as a noble but a liberal profession, and feel and act as if all those who enter honorably within its pale belong to the brotherhood. With the ancients, the fabulous Apollo was not only the god of physic but of poetry and eloquence.

We all have our parts allotted in that single though apparently shifting scene of the great drama of time, in which we appear, walk or strut our brief hour, and then retire. It may be humiliating to our pride to acknowledge it, but it is true that of every thousand educated men the memory of 999 survives not the generation in which they live, beyond the circle of their own families or descendants. It ought not, however, to discourage us. The duty of every being possessed of reason and conscience is to improve the opportunities he may enjoy, in preparation for the responsibilities he may be called on to assume and bear. It is only thus he can hope to possess the contentment which flows from a conscience at peace with itself. It is thus only he can be assured that he can and will fill the measure of usefulness to his family, his country and mankind, which is the true aim of an honorable ambition. Your profession demands the heart of him who would succeed in it. He who does not love it and is not earnest in the pursuit had better abandon it. The highest standard of professional attainment must be his aim, and no means are to be despised which can aid in the accomplishment of that purpose. Do not exclaim with the gay-hearted Grecian, "drink to-day, for to-morrow we are not." Do not float down the current smiling if you can, silent if you must. Away from the dream of the heath-bells, soaring up to the sun. The keys of knowledge are in your hands, the portals of the temple are open to you. Go on in the utter and unpitying sacrifice of self. Follow His footsteps, and reflect His beauty, and attain His blessing who went about doing good. Go on, and let your achievements in veterinary science add a new kingdom to the realms of charity, civilization and christianity.

NEW RESEARCHES UPON PLEURO-PNEUMONIA AND ITS PREVENTIVE INOCULATION.

BY DR. WILLEMS.

(Continued from page 464.)

In concluding, I propose to present the Academy with my views upon the etiology of exudative pleuro-pneumonia.

This disease is of a virulent character ; this is universally admitted.

But what is a virus ? It is a mysterious entity, whose essential constitution is as little known as that of electricity ; its ultimate character is revealed only by its effects, and its constitution still escapes our investigations. But it is to be hoped that a day will come when, with our powerful means of investigation, we shall succeed in fully enlightening ourselves, and be justified in placing greater numbers of virulent diseases in the class of parasitic affections.

Transmissible or contagious diseases, or those which are transmitted from a diseased to a healthy organism, may be divided into two classes—first, the *virulent* diseases ; that is, those which are transmitted by a contagium whose nature is yet unknown ; and again the *parasitic* diseases, whose agents of transmission have been known during various periods of time, such as scabies (acarus), ring-worm (trychophyton), trichinosis (trichina), foot and mouth disease (oidium).

After these, thanks to the recent discoveries of Davaine and Pasteur, we find, anthrax (bacteridie), septicemia (septic vibrio), and chicken cholera.

The diseases of this second class are at the present time well known, and consequently can no longer be ranked amongst the virulent diseases ; microscopic studies have revealed their nature, and brought to our view as agents of contagion, the germ-corpuscle and the parasite, animal or vegetable, which can be repro-

duced by culture, according to the admirable methods of Mr. Pasteur.

Exudative pleuro-pneumonia also proceeds from an inferior organism, which is the agent of its transmission, and which can be reproduced. This affection must, consequently, take rank in the class of parasitic diseases.

I desire here to recall the fact that in 1850, in my first paper, I stated that Prof. Van Kempen and myself had found in the exudates of pleuro-pneumonia and in those of the pustules or tumefactions following its inoculation, a corpuscle, with a peculiar motion and which exists only in this affection, but whose signification at that time was unknown to us.

Now, guided and enlightened by the discoveries of our contemporaries, and especially those of Mr. Pasteur, I have resumed the study of these corpuscles, which thirty years ago had aroused my attention and curiosity, and after new investigations, I think I can affirm that it is a true parasite.

In my preceding researches, I had established that the power of contagion resides in the expired air from the lungs of a sick animal, and in the exudate which is found in the interlobular tissues of these organs. Subsequently, I found that the germ corpuscle is met with in almost all the tissues and fluids of the sick animal. It is seen in abundance in the lung, the effused fluid of the pleura, and the pathological products of the intestines, of the liver, &c. It is in small quantities in the blood and muscles; but still, in these last sufficiently discoverable to allow one to recognize the meat of a pneumonic animal.

In my studies upon the nature of the parasite, I have had in view not only a purely scientific object, but have hoped to reach, also, one of practical utility, in determining which is the most convenient matter to inoculate; from what part the virus ought to be taken, and how, and during how long a time it can be preserved.

Experiments will also be made with a view to obtain a cultivated and weaker virus, as Mr. Pasteur has done for chicken cholera, and thus obtain for inoculators a sure and efficacious virus.

I feel obliged to recall the first researches made upon these germ corpuscles by Mr. Van Kempen, the distinguished professor of pathological anatomy in the University of Louvain, and by myself.

I said: "I have examined different pathological portions, for the purpose of studying and elucidating the question of inoculation. My investigations have principally been of diseased lungs and upon a form of tubercle, unrecognized till then, but that I have, however, constantly found in the autopsies made upon animals which had died with pleuro-pneumonia. The tubercles which spread in all the intestines, especially the small, were of a size varying from that of a pin-head to that of a large pea, being of a yellowish or greenish color, and situated in the sub-mucous cellular tissue, and partly in the thickness of the intestinal membrane. They seem to have no link of origin with Peyer's or Brunner's glands. Are they hyperplastic follicles? Nothing seems to prove it; they show no openings. They are formed of an homogeneous whitish matter, more or less hard, presenting under the microscope granular nuclei and a large number of small elementary corpuscles, which have a molecular motion, and which are also found in the diseased lungs, as I will show further on. I have subjected parts of lungs of pneumonic animals to the microscope, with a magnifying power of 540 diameters; much greater than that of the one used by Prof. Gluge in his handsome anatomico-pathological researches upon pleuro-pneumonia. The exudated matter presented no structure; I have found in it no other anatomical elements than granular nuclei and elementary corpuscles with a peculiar motion, the whole having a strong resemblance to an inflammatory exudate, remarkable for its great quantity. The plastic exudations are formed so rapidly and in such quantity, that anatomical elements of a higher development than that of these nuclei cannot form themselves; consequently there are no cells, no pus corpuscles, (I found none) no fibrils. The strength of the cellular tissue seems to exhaust itself on too large a quantity of exudated matter, for this to reach a higher degree of organization. It is as one observes it sometimes in the regeneration of tissues; for instance, in the section of nerves and

in fractures of bones, when the exudated fluid is in too great a quantity, or when the fragments are so far apart that a portion of the exudate is left beyond the circle of action, and the strength of the existing tissues remains consequently in a degree of development inferior to that of the surrounding tissues. That which is most important here to observe, and to which no one has yet referred, is *the existence in the diseased lungs of small corpuscles having a molecular movement, which seem some times to take place in a given direction.* They are like corpuscles in the process of formation, whose motion resembles that of fragmentary granules, as well of those which surround the corpuscles of the tuberculous matter of man. In all my microscopic researches I have always found the same thing.

“I have examined with the microscope parts of the dermis (this I have yet preserved in alcohol) of an ox, dead after inoculation. I have found in it the same microscopic elements and the same chemical characters as in the lungs of pneumatic animals.

“To strengthen my observations and have them confirmed, I sent on the 12th of February, 1852, to Mr. Van Kempen for examination, portion of skins and of the tissue underneath, of an animal which had died the previous day from inoculation. The learned professor wrote me :

“I have examined the specimens that you sent me ; I have “found in them small corpuscles, with a peculiar molecular “motion ; they vary much in size ; some are punctiform and “others present a well marked central light ; they resist the “action of acetic acid. In the same piece of skin, I found “masses of granular nuclei, containing a nucleus. These nuclei “resist the action of acetic acid ; it is their special character. It “was absolutely as if there was an abundant exudation in the “dermis.”

Mr. Van Kempen was then entirely ignorant of the inoculation I was making, and of the disease to which the animal had succumbed.

The physical characters, microscopical examinations and chemical analyses of the part where the inoculation has been made,

prove that the local artificial lesions, brought on by inoculation, has the greatest resemblance to the morbid lesions and processes observed in the lungs of animals which have contracted disease under the epizootic influences of pleuro-pneumonia.

Mr. Didot says, "The discovery of these corpuscles constitutes a fact too important to be allowed to pass unnoticed; therefore the Central Commission thought of it, and Dr. Willems was asked to make a special demonstration of it before the Commission. Their existence was observed by all the members, as it had been by M. Willems and Van Kempen. Prof. Gluge alone considered them as one of the ordinary products of inflammation."

After these first demonstrations, Mr. Voigtlander of Germany, Ercolani of Bologna, and Dr. Gastaldi in Italy, proved that there exists in pneumonic animals peculiar corpuscles other than those met in the single phlegmasia, and that, consequently, I was right in attributing to them a special origin and nature.

"Our first care," these Italian savants say, "was to look for the *elementary granules with peculiar motion* of Willems. With this object, one took pieces of lungs, in the part which was most diseased, and we were charmed to find numerous groups of small corpuscles more or less closed to each other.

"These groups would separate, under a moderate pressure, into a variable number of granules or corpuscles, about the size of blood globules, the form of which they somewhat resemble; that is, they were spherical, concave in the center; nevertheless, transparent and having their outlines well marked and dark.

"Treated with pure water, their form is not in the least altered; the same condition remains when treated by acetic acid, only that they then become more transparent, because while the corpuscles remained intact, the portions of the lung where they were became clearer and more transparent.

"These corpuscles seemed of the same nature as those found by Guerin-Meneville in the blood of insects, and were considered by him as *parasites*, and which he called *hematozoaires*.

"These elementary granules exist as rarely in the lungs as in the skin, where, however, they were more numerous and are collected and circumscribed in smaller groups. But we did not find

in them the molecular motion spoken of by Willems; still, its absence is of no value and ought to be considered only as simple brownian motions, manifest in all the corpuscles of extreme small size, when, freed from all attachment, they float in a liquid. This last condition was entirely absent in the present case, for the reason that the granules were surrounded by a great quantity of coagulated fibrine, infiltrated in the pulmonary tissue.

“Mr. Willems asks if these granules are primitive or secondary in the disease?

“Considering that like corpuscles, with a similar peculiar motion, are seen in the larvæ of the lepidoptera in pathological conditions, especially in the muscardine of the silk worm, and specially in the butterfly, when it dies a natural death, from which comes the probability that those are an effect rather than the essential cause of the condition which naturally brings on death after a short time in perfect insects, and again noticing that, in the given case, these corpuscles were in quite large number in spots deeply altered, that they were gradually diminishing, leaving these spots by degrees, and they were not found in the parts of the lungs which had retained their normal aspect, one is, therefore, disposed to consider them more as secondary than as primitive in the disease.”

Since that period the study of these corpuscles has been discontinued, until in later days it was resumed by me.

Wishing to have the correctness of my remarks confirmed, I asked one of the members of the Academy, Mr. Cousot, whose studies lie especially in that direction, and two specialists of the University of Louvain, Prof. Verriest and Bruylandt, to assist me. This they willingly consented to do and I wish to present here my public thanks for their courtesy. With me my worthy colleagues have recognized the existence of the microbe of the parasite in question, and its culture by Pasteur's processes has been effected by them with complete success to the eighth generation.

This intervening microbe is treated with all the caution required by its importance, and in the liquid of culture most often selected, it grows in innumerable quantity and appears exceed-

ingly vigorous and vivacious. The product of this culture will be inoculated to a series of animals; others will be exposed to the vaporization of this liquid, and in all the vapors conveying the microbe will be allowed to penetrate into the organism of cattle by the natural roads of contagion. We will endeavor also to determine with precision the liquid best adapted to inoculate, and to produce by culture a pure vaccine, abundant and always at the disposal of inoculators. I propose to treat *ex professo* and with all necessary details that interesting question, and to present the Academy with this new work.

Gentlemen, at the risk of abusing your kindness, I believe it my duty to offer you an adhesion to my principles, too important to remain unnoticed.

Some days ago, I addressed letters to Mr. Bouley and to Mr. Pasteur, with a view to obtain their opinions upon the question I have treated before you. Allow me to read part of the answer of Mr. Bouley. This eminent colleague entertains the same hope concerning the reality of the discovery of the microbe of pleuro-pneumonia, and as to the positive service that it will render to operators in furnishing them with perfect and certain vaccine, free from heterogeneous elements.

He says: "This question (of the presence of a microbe in the virulent liquid of peripneumonia) I treated before Mr. Pasteur, in a few words, at a meeting of the Central Society of Veterinary Medicine, where Mr. Pasteur who is a member, had related the results obtained in its experimental researches on chicken cholera. I was surprised, in his laboratory, to observe the analogy, or rather the identity, in an objective point of view, between the lesions produced by the insertion of the virus of this *cholera* and those of the peripneumonic virus; and I had come to the conclusion that like the other, this one was constituted by microbes, whose abundant multiplication in situ would produce those lesions so nearly alike. It had been understood with Mr. Pasteur, that I would give him an opportunity to collect in an abattoir, some peripneumonic virus, to have it cultivated; but his other researches did not allow him to attend to this. His laboratory is full of chickens upon which he is constantly experimenting, and

the time necessary is not at his command, to permit him to undertake a new series of experiments. But it is only postponed, and I will soon furnish him with the means of beginning the researches you speak of. * * * *

“I do not despair to see the day when the liquid for inoculation will be no less than the *liquid of culture* of the microbe, that is to say, pure of all foreign elements and especially those of a septic character.” * * * *

He closes by saying: “You can depend on me to bring to a good end this question of inoculation, and to remove all the inaccuracies that *negative* facts contribute to maintain in the public mind. I hope much for a positive solution from experiments in the laboratory. It is certain that facts cannot be contradictory, at one time saying yes, and no at another. If then they seem such, it must proceed from the *quality* of the inoculated liquid and the mode of inoculation. That must depend also on the actual condition of contamination at the time the inoculation is made. If the animal is already infected through the *ordinary* channels of contagion, it is not astonishing if the inoculation fails, inasmuch as the enemy is already in the fort, when one proposes to guard against it.

“However, dear sir, your discovery of the immunity secured by preventive inoculation remains impregnable. The new phase in which we are about entering, that of experimental study, cannot fail to furnish a powerful corroboration of the truth that you have established, or to remove all obstacles which might hinder preventive inoculation from producing all the economical results its careful practice must secure.” * * * *

We hope soon to resume our researches and to be able to communicate them to the Academy.

LAW RELATING TO THE PREVENTION AND SUPPRESSION OF EPIZOOTIC IN GERMANY.

Passed June 23d, 1880.

(Continued from p. 490.)

2. SPECIAL PRESCRIPTIONS FOR SOME DETERMINED EPIZOOTIC DISEASES.

§ 30. The Federal Council will publish by way of public instruction, the prescriptions of detail relating to the application and execution of the proper measures of prevention, so far as they concern the following named epizootic diseases, and each of the other epizootic diseases specially.

However, in relation to the epizootic diseases named in those instructions, the special prescriptions following will be applied without prejudice to other necessary measures of prevention.

(a) *Anthrax.*

§ 31. It is forbidden to kill for butchery animals affected or suspected of anthrax.

§ 32. Appointed veterinarians only are authorized to perform bloody operations upon animals affected or suspected of anthrax.

Approved veterinarians only are authorized to open a cadaver without permission from the police authority.

§ 33. The cadavers of animals dead from or killed as being affected with anthrax, or suspected of it, will be immediately removed in such manner as they cannot become dangerous.

It is forbidden to remove the skin.

Similar prescriptions are applicable to the cadavers of all game dead or killed when anthrax exists amongst them.

(b) *Rabies.*

§ 34. All dogs or other domestic animals suspected of rabies, must be immediately killed by their owner or person under whose care they may be, or confined in a safe place until the police has intervened.

§ 35. It is forbidden to make any attempt to cure any animal affected or suspected of rabies, before the interference of the police.

§ 36. It is forbidden to kill for butchering, animals affected or suspected of hydrophobia, or to sell or use parts of them, such as milk or other products.

§ 37. When rabies has been ascertained in a dog or other domestic animal, he will be ordered to be killed immediately, as well as all dogs and cats which may be supposed to have been bitten by the diseased animal.

If the same suspicion exists towards other domestic animals, these must also be submitted to the observation of the police.

If said animals show any symptoms of rabies, they must be immediately killed.

The sequestration for at least three months of a dog suspected of rabies, may be exceptionally allowed in the case where, according to the opinion of the police authority, it can be carried out with sufficient warranty of security, and when the owner of the animal is willing to pay the expenses of the inspection.

§ 38. When a dog affected or suspected of rabies has been through a locality, the police authorities must, as long as there may be danger, order the *sequestration* of all the dogs which are in the district where the danger exists. It will be considered equivalent to sequestration if the dog is held with a string, or when he carries a muzzle, affording all chances of security. Dogs which contrary to these prescriptions are at large, may be immediately killed by police order.

§ 39. All cadavers of animals, dead or killed as affected or suspected of rabies, must be immediately removed in such a manner as shall not interfere with the public safety.

It is forbidden to remove the skin of such animals.

(c). *Glanders (farcy) of horses, donkeys and mules.*

§ 40. As soon as glanders or farcy is ascertained in animals, the police must immediately order them to be destroyed.

§ 41 Suspected animals must be sequestered and placed under observation by the police, with the necessary restrictions adapted to the case, as to their circulation, use or isolation.

§ 42. The police shall order the destruction of suspected animals :

When the eruption of glanders or farcy shall have been declared probable by the official veterinarian, according to the symptoms he had observed ;

When the case is such that the propagation of the disease cannot be efficiently prevented by other measures in accordance with the prescriptions of the present law ;

When the owner of the animal asks that it be killed, and that it is in the public interest that the disease be removed as soon as possible.

§ 43. The cadavers of animals dead or killed must be immediately removed, so that no further danger may remain.

It is forbidden to remove the skin of those animals.

§ 44. The police authority is required to give information immediately, in writing, of the cause of suspicion and of each first eruption of the disease in a locality, as well as the course followed by the disease, and its disappearance, to the Chief Commanding General of the Corps d'Armée, in the circumscription of the locality where he is situated. If in said locality there is a garrison, the governor or commanding officer will receive said information.

(d). *Peripneumonia of bovines.*

§ 45. Upon the opinion of the official veterinarian, the police authority shall order that the animals affected with pleuro-pneumonia shall be killed ; it may also order the death of suspected animals.

(e) *Small-pox in sheep.*

§ 46. After its presence in a flock has been ascertained, the inoculation of the sheep which have not yet been affected with the disease, shall be ordered.

At the request of the owner or his agent, a delay may be granted to have the operation performed, if, according the opinion of the veterinarian, there is no necessity for proceeding at once.

At the request of the owner or his agent, the inoculation may be dispensed with, in a case where the measures taken shall be of sufficient warranty that the other animals, still healthy, shall be

killed within ten days from that of the authentication of the eruption of the disease.

§ 47. If the disease assumes extensive proportions, or if from local circumstances, it is not impossible for the disease to be propagated among surrounding flocks, the inoculation of the flocks threatened, and that of all sheep in the locality, may be ordered by police authority.

§ 48. Inoculated sheep must be treated in respect to preventive measures, to be taken by the police authority, like other affected animals.

§ 49. An inoculation cannot be proceeded with unless authorized by the police authority.

(f) *Diseases of Coit (Dourine) of horses, and Coital exanthema of horses and bovines.*

§ 50. Horses affected with dourine and horses and bovines with coital exanthema of the genital parts cannot be admitted by their owner to copulation, until the official veterinarian has ascertained that they are entirely cured and are not even suspected.

§ 51. When the disease exists extensively in a district, it may be established in a general way, and so long as danger exists, a horse shall not be admitted to copulation until he has been inspected by the veterinarian.

(g) *Scabies of horses, mules and sheep.*

§ 52. When scabies has been ascertained to prevail amongst horses, donkeys, mules, (scabies by sarcoptes by dermatocoptes) or in sheep (scabies by dermatocoptes), the owner may be requested, unless he prefers to have the diseased animals destroyed, to submit them immediately to treatment by an approved veterinarian.

(3) SPECIAL PRESCRIPTIONS FOR LARGE MARKETS OF ANIMALS FOR SLAUGHTER AND PUBLIC ABATTOIRS.

§ 53. The above regulations apply to great markets of animals for slaughter and public abattoirs, under the police veterinary control, and to the beasts for slaughter which may be there, with the exceptions established by the following regulations.

§ 54. When amongst beasts for slaughter which are in these

establishments, the existence of a contagious epizootic is ascertained, or symptoms have been observed which, according to the opinion of the veterinarian, are of such nature as to justify a suspicion of the presence of the eruption of such epizootic, all the diseased or suspected animals shall be immediately sequestered by the police, and no contact with other animals allowed.

§ 55. The owner of animals for slaughter, diseased or suspected, or his agent, may, so long as the nature of the disease allows, be obliged to have such animals immediately destroyed under the survey of the official veterinarian, and in special places selected for the purpose.

This measure may be extended, if necessary, to all other beasts of butchery, which are in the respective localities, and which may be in danger of contracting the disease.

§ 56. The eruption of the epizootic being ascertained, the great markets of animals for slaughter, and public abattoirs, may be closed to prevent the exit of animals susceptible of being affected, so long as such danger may exist.

More severe measures of isolation can be taken, in urgent cases.

(4). INDEMNITY FOR DESTROYED ANIMALS.

§ 57. Except the cases specified in the present law, an indemnity must be given for animals destroyed by police order, or that have died since that measure has been taken.

§ 58. It is left to the different States of the Confederation to decide :

1st. By whom the indemnity shall be granted and from what funds.

2d. How, in each peculiar case, the indemnity shall be fixed.

Nothing is referred to in these regulations contained in the prescriptions already existing in those States. So long as these prescriptions are not contrary to the same, the governments of the different states are authorized to decide what the indemnity for destroyed horses and bovines shall be, until other regulations according to the constitution of the country may be established, by cotisations made by owners of horses and bovines, the division

and giving off of which shall be regulated by the government of each country.

The dispositions of section 59 and 64 of the present law, however, shall be applicable in all cases.

§ 59. The indemnity to be granted shall be the ordinary value of the animal, without reference to the diminished value of the animal because he is affected with the disease. But for animals affected with glanders the indemnity shall be only of three-fourths and for bovines affected with pleuro-pneumonia of four-fifths of the value thus established.

The council determines that the indemnity shall be

1st. The sum of insurance to be paid according to private contracts, viz. the three-fourths of that sum for cases of glanders and the four-fifths for the cases of pleuro-pneumonia, and the entire sum in all the other cases.

2d. The value of the parts of the destroyed animal which remain at the disposition of the owner, according to the measures taken by police authority.

§ 60. The indemnity shall be paid to the person under whose care the animal was when he was destroyed, unless another having right to it be known.

This payment having been made, all right to further indemnity shall cease.

§ 61. The indemnity shall not be granted :

1st. For animals belonging to the Empire, the special States, or which belong to horses the property of the sovereigns of those States.

2d. For animals which, contrary to the prescription of section 6, have been imported into the imperial territory, being already affected with the disease.

3d. For animals in which glanders is established, in the delay of 90 days, and pleuro-pneumonia in that of 180 days from their importation into the imperial territory, unless it is proved that the animals have become affected with the disease since their importation.

§ 62. The indemnity can be refused :

1st. For animals which had been affected with a disease, which

by its nature or from the degree of its development, was incurable and necessarily fatal, with the exception of glanders and pleuropneumonia.

2d. For animals for slaughter which have been in great markets of animals for butchery or in public abattoirs, and which have been killed or destroyed by police order.

3d. For dogs and cats which have been killed because of rabies:

§ 63. The right to an indemnity shall not exist:

1st. When the owner of animals or the agent of the establishment to which such animals belong, shall have knowingly or negligently omitted; or when the person having charge of the animals, or the owner of the farm, stable or pasture, shall have in relation to the animals placed under his care, omitted knowingly, contrary to prescriptions of sections 9 and 10, to make the declaration of eruption, or of the suspicion of the disease, or shall have delayed more than 24 hours since he has had knowledge of it.

2d. When the owner has bought, or obtained from other circumstances, one of the animals which were affected with the epizootic disease, and that at the time of this acquisition he knew that the animal was diseased.

3d. In the case of section 25 or when it has been ascertained that the owner or his agent has not observed the measures of prevention against the epizootic as prescribed by the police authority or that he has violated them.

§ 64. When to furnish funds for the payment of the indemnities, collections shall be made in proportion to the number of horses or bovines which are in the locality, those collections cannot be claimed for animals belonging to the Empire, special States or horses which are the property of the sovereign, and in the case of section 62, No. 2, for animals of butchery which are in large markets of such animals and public abattoirs.

III.

PENALTIES.

§ 65. The penalties for violation of these regulations shall be a fine not exceeding 150 m. or imprisonment for not less than

one week, unless by already existing laws more severe penalties are incurred.

1st. Whoever shall import contrary to prescriptions of section 6, animals affected with contagious epizootic disease.

Beside the penalty, the tribunal shall pronounce the confiscation of animals imported contrary to this prohibition, whether these animals are the property of the offender or not.

2d. Whoever shall violate sections 9 and 10, by neglecting the declaration of the eruption of the epizootic disease, or of the suspicious signs which excite apprehensions of the disease, or shall delay to make it more than 24 hours after he has knowledge of it, or shall not keep the suspected animals in a place distant from that where the danger of infecting other animals exists.

3d. Whoever shall kill, contrary to sections 31 and 33, animals affected with anthrax or suspected of that disease, or who shall perform bloody operations or remove the skin; or shall open their bodies contrary to prescriptions, or shall not remove them so as to prevent further danger.

4th. Whoever shall violate the prescriptions of sections 34, 35, 36 and 39 established against rabies or domestic animals.

5th. Whoever shall remove, contrary to section 43, cadavers of animals dead or killed as affected with glanders, or shall not remove them in such a manner as shall be harmless.

6th. Whoever shall inoculate a sheep except in the case where this operation shall be ordered by police authority.

7th. Whoever shall admit to copulation, contrary to section 50, horses affected with dourine, horses and bovines affected with coital exanthema.

§ 66. Shall be punished by a fine not exceeding 150 m., or imprisonment unless by other existing laws a more severe penalty is incurred:

1st. Whoever shall violate the restrictions applicable to the importation of animals according to section 7.

Besides the penalty, the tribunal shall proclaim the confiscation of animals or objects imported contrary to the prohibition, whether the same are the property of the offender or not.

2d. Whoever shall violate the measures of control established by the police by section 8 of the law.

3d. Whoever shall violate the provisory measures taken by the veterinarian in the cases of sections 12 to 2 and 17 to 2.

4th. Whoever shall violate the measures of prevention taken by the police authority, when there is danger from epizootic disease.

§ 67. When in the cases named in sections 65 and 66 the violations have been committed with the object of gaining an advantage for himself or others, or to cause a damage to others, the offender shall be condemned to a fine not less than 50 nor exceeding 150 m., or to an imprisonment of not less than three weeks, unless by already existing laws a heavier penalty is incurred.

VI.

FINAL DISPOSITIONS.

§ 68. The present law affects nothing relating to the law of February 25, 1876, relating to the disinfection of railroad cars in which animals are made to travel.

§ 69. The present law shall take effect upon the 1st of April, 1881.

ANNUAL COMMENCEMENT OF THE AMERICAN VETERINARY COLLEGE.

The annual commencement of the American Veterinary College, closing the session for 1880-81, was held at Chickering Hall, on the 24th of February, before a full house.

The platform of the hall was handsomely decorated with flowers, an excellent band of music gave entertaining musical selections, everything being well arranged to make the occasion a success.

The opening prayer was delivered by the Rev. Dr. Newman. The Degree of Doctor of Veterinary Surgery (D. V. S.), was conferred by the President of the Board of Trustees, Samuel Marsh, Esq., upon the graduates who received their diplomas from the

Dean of the Faculty, and the prizes were awarded with appropriate remarks by Prof. A.W. Stein, M.D. The valedictory address was delivered by David J. Dixon, D.V.S., and was listened to with much interest. The address to the class was given by Mr. Jerome Buck.

The following are the names of those who received their diplomas :

Bunker, Madison	Mass.
Burt, Walter L.	R. I.
Crane, Lemuel M.	N. Y.
Cowhey, Thomas C.	Miss.
Dixon, David J.	Pa.
Dougherty, John	N. Y.
Duane, John, Jr.	N. Y.
Gaentner, Chas. T.	Pa.
Hall, Ralph W.	N. Y.
Harrison, Robert H.	Mass.
Hoskins, W. Horace	Pa.
McKenzie, Alexander	N. Y.
McNicol, James E.	N. Y.
Martins, Alfred F.	N. Y.
Mercer, Elmore R.	West Indies.
Murray, John	N. Y.
Parsons, Frank H.	N. J.
Sherman, Walter A.	Mass.
Tourtelotte, Lincoln H.	Wis.
Walton, Sharpless M.	Pa.

The prizes distributed and those receiving them were as follows :

Trustees' prize—gold medal for the best general examination, Robert H. Harrison.

Alumni prize—set of standard works for the second best general examination—John Dougherty.

N. Y. State Veterinary Society prize—gold medal for the best practical examination—John Dougherty.

Prof. Liantard's prize—for the best anatomical preparation—James E. McNicol.

Anatomical prize of Prof. Liantard, for the best examination in the junior class—John A. Leyton.

The College re-opens for the Spring session on the 1st of March and continues until the middle of April.

SOCIETY MEETINGS.

MONTREAL VETERINARY MEDICAL ASSOCIATION.

The regular fortnightly meeting of this Association was held in the lecture room of the Veterinary College on Thursday evening last, Mr. C. J. Alloway, V. S., President, in the chair. Mr. William Bell, Kars, Ont., was balloted for and elected a member of the Association. After the usual preliminary business had been disposed of, the Chairman called on Mr. Richard Price to read his communication on *enteritis*. Mr. Price described the history, symptoms, treatment and post mortem lesions of a typical case from notes taken by himself, which gave rise to an interesting discussion. Mr. C. B. Robinson, St. Thomas, Ont., read the notes of a case diagnosed to be acute nephritis in a horse on his own farm, which yielded to active treatment and made a rapid recovery. Mr. E. J. Carter was then called upon to read his paper on counter irritation in the treatment of chest affections. The reader stated that this was a subject which had of late given rise to considerable discussion among veterinarians, especially in England, some of the best minds in the profession being for and against the employment of counter irritation in the treatment of chest affections. He gave a *resumé* of the arguments advanced *pro* and *con*, and summed up by agreeing with the idea that counter irritation has been used too much in chest affections and ought to be replaced by milder and more soothing treatment. Mr. M. C. Baker, V. S., considered that the idea of applying counter irritation to the chest for the purpose of drawing blood from the inflamed lung or pleura was wrong in theory, as by increasing the cutaneous circulation the pressure of pulmonary circulation is

increased, and harm produced instead of good. He would object except in lymphatic horses, to actual counter irritation, but favored mild stimulation of the chest. Dr. W. McEachran considered that the application of hot poultices to the chest was to be preferred to actual counter irritation, as it caused less irritation to the animal. Prof. McEachran stated that in his experience poultices to the chest had a much more soothing effect on the animal, and objected to severe blistering on account of the irritation produced on the animals and the injury sometimes produced on their sides. The chairman thought that fomentations or poultices were more rational, and produced better results than counter irritants. Other speakers followed, the majority being in favor of a milder form of treatment. The secretary also read an interesting communication received from Mr. W. L. Williams, V.S., Bloomington, Ill., U.S.A., recording eight cases in which he punctured the intestine in the horse for tympanitis, in all of which he was successful in relieving the animal, and in none of which was peritonitis produced, and from which he concluded that the use of the trocar and canula is as safe in the horse as in the cow. He also recommends its use early in the affection. A vote of thanks was then passed to the essayists and to Mr. Williams. At next meeting Dr. James Bell will read a paper, and Mr. Joseph Skally and Mr. John Chandler will communicate cases.—*From the Montreal Gazette.*

UNITED STATES VETERINARY MEDICAL ASSOCIATION.

The semi-annual meeting of the United States Veterinary Medical Association will take place in Boston on Tuesday the 15th of March, at Young's Hotel.

As many important subjects are to be brought before the Association and probably some interesting papers will be presented, it is desirable that as many of the members as can leave their business on that day, be present. Only two meetings are held yearly by the Association, and the interest which is shown by the attendance, judging by the numbers, is not always on a level with

the sanguine expectations of many who come far to attend. We hope this meeting will show a good number of members of the veterinary profession belonging to the Association, ready to answer the roll call.

ALUMNI ASSOCIATION OF THE AMERICAN VETERINARY COLLEGE

The fourth regular meeting of this Association was held in the lecture room of the college building, on Thursday the 24th of February, at 11 o'clock A. M.

The meeting was called to order by President C. B. Michener, D.V.S., and the following gentlemen answered the roll:

Drs. Michener, Coates, Hopkins, Gerth, Field, Corlies, Weeks, Cowley, Foote, Boyd, Miller, and R. McLean.

The minutes of the last regular and special meetings were read and adopted.

The Secretary was then instructed to add the names of the lately graduated members of the class 1880-81 to the roll of the Association.

The election for officers being next in order, the following gentlemen were elected by ballot for the ensuing year:

President, Dr. C. B. Michener; Vice-President, Dr. J. F. Winchester; Secretary, Dr. J. D. Hopkins; Treasurer, Dr. S. S. Field; Librarian, Dr. D. W. Cochrane.

The Chair appointed the following committees:

Executive Committee, Drs. Coates, Field, Corlies, Foote, McLean, Myers, Jr., and Cosgrove.

Library Committee—Drs. Gerth, Hopkins and Weeks.

A special committee consisting of Drs. Foote, Coates and Dougherty was appointed to take such measures as may be necessary to obtain from the medical colleges such recognition of the American Veterinary College diploma as would enable the holders to present themselves for examination for the M. D. degree after attending their lectures during a course of one year.

R. McLEAN, D.V.S.,
Secretary, pro tem.

CORRESPONDENCE.

GOOD VETERINARIAN WANTED.

CAMBRIDGE, MARYLAND, Feb. 23, 1881.

PROF. LIAUTARD :

DEAR SIR—We are very much in need of a veterinary surgeon in our midst, and I have been recommended to suggest to you the propriety of some one of your graduates settling hereabouts.

Cambridge is a desirable centre for the Eastern Shore of Maryland.

I am quite confident that a good surgeon would do well in this location. There is none within eighty miles, and the country is filled with horses, many of whom die from lack of timely and proper treatment.

Any gentleman coming here with the wish to settle with us, may call on James M. Stelle, who will take pleasure in introducing him to the public.

Very respectfully yours,

JAMES M. STELLE.

[This letter is published for the benefit of young graduates who might be looking for a good place to start practice.

A similar application was received as we went to press, from Hazleton, Pa. Any one desirous of information, can write to Mr. C. F. Hill, U. S. Commissioner, Hazleton, Pa.]—ED.

NEWS AND SUNDRIES.

Three alumni of the American Veterinary College have recently obtained the degree of M.D.

Dr. Charles H. Hall, of New York, at the Medical Department of the University of the City of New York.

Dr. John C. Myers, Jr., of Cincinnati, at the Cincinnati Medical College.

Dr. Hubert T. Foote, of New York, at the Eclectic Medical College of the City of New York.

The annual dinner of the Alumni Association of the American Veterinary College was held at Donovan's restaurant in New York City on Wednesday evening the 23d of February. A pleasant evening was enjoyed by the members present, and renewed exertions are to be made to make these annual reunions a success. Many toasts were presented and answered, and the company separated in the early hours of the next day well satisfied with the meeting, the first official held by the Association.

EXCHANGES, ETC., RECEIVED.

HOME EXCHANGES.—Scientific American, Medical and Surgical Reporter, Turf, Field and Farm, Medical Record, American Agriculturist, American Scientific, Prairie Farmer, National Live Stock Journal.

FOREIGN EXCHANGES.—Revue d'Hygiene, Clinica Veterinaria Veterinary Journal, Veterinarian, Recueil de Medecine Veterinaire, Archives Veterinaires, Annales de Belgique, Gazette Medicale, Revue fur Thierheilkunde und Thierzucht.

NEWSPAPERS.—Farm and Fireside (Ohio), Boston Post, Farm and Home (Mass.), The Gazette (Montreal).

BOOKS.—Manual of Cattle Feeding, by H. P. Armsby, M.D.; Report of the Commissioners on Contagious Diseases of Mass.

PAMPHLETS.—Essai de Regeneration du Virus Vaccin par une Methode Nouvelle, par Ed. Dele; Ueber die Wirkungen der Gebrauchlichsten Orntipeptior auf Einige Contagien, von Alfred Krajewski; Rules of the Montreal Veterinary College Medical Association.

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